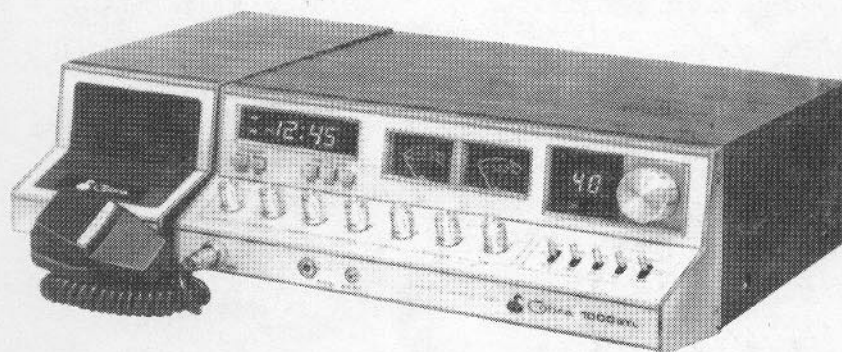


Price \$39.95

C.B. TUNE-UP MANUAL MASTER EDITION



Volume 4

**Covers standard radio tune-up information
Channel modifications
Repair tips**

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VOLUME 4

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C.B. TUNE-UP MANUAL MASTER EDITION

VOLUME 4

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INTRODUCTION

Improving C.B. performance is often attempted by many without knowing which adjustments to use, or modifications to make. Even more frustrating is trying to remember or to compile this information for future use. It is our goal to supply you with good useful information in an easy to understand and use MANUAL FORMAT. We feel that it is very important to supply information that will be useful and profitable for you, the technician.

With this volume we have again included several channel conversions on many popular PLL Chips and Radios. This is in response to the many requests that we have had for this type of information and on these particular units. We realize that some of you may already know some of these modifications. Regardless, it is our intention to cover all bases and supply a broad base of requested information in order to provide something for everyone.

Also included in this volume is a complete **Index** listing covering CB TUNEUP MANUALS Volume 1 thru Volume 4. This should be a great time saver for any future reference.

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HOW TO USE TUNE-UP INFORMATION

In COLUMN 1 you will find the MODEL NUMBER of each radio, COLUMN 2 provides MODULATION information, COLUMN 3 provides AM POWER ADJUSTMENTS, and COLUMN 4 lists S.S.B. ADJUSTMENTS if applicable. On some S.S.B. models we have shown 2 adjustments. The first will be for S.S.B. modulation and the second is for the S.S.B. power (ALC). If only one adjustment is shown in the SSB column then it will be for S.S.B. power (ALC).

MANUFACTURER NAME			
MODEL	MODULATION	AM POWER	SSB POWER
MCB-5000 ¹ ←	R268 or Cut D207 or Rem.C273	L202,L204	RV8,RV5
See footnote for more specific information.	Adjust R268 for modulation or cut one end of D207 or remove C273 from the circuit.	Adjust L202 & L204 for Am Power .	Adjust RV8 for SSB modulation & RV5 for SSB power.

Some of the POWER ADJUSTMENTS listed do not have tuning slugs. However these coils can still be adjusted by either spreading the coils or by moving the coils closer together. These coils can be modified by removing 1 turn in order to allow you to move them closer together, and thus increase tuning range.

GALAXY RADIOS			
MODEL	MODULATION	AM POWER	SSB POWER
SIRIUS	VR4 or cut R124	L18,L21,L25	

Variable Alignments

GALAXY SIRIUS

VR1 = Receive Meter
VR2 = Squelch Adjust

VR3 = FM Deviation
VR4 = Modulation Adjust

VR5 = SWR Pre-Calibrate
VR6 = Transmit Meter

HUNTER RADIOS			
MODEL	MODULATION	AM POWER	SSB POWER
HUNTER 120	RV3 or Cut D9	L11,L12,L13	

J.C. PENNY RADIOS

MODEL	MODULATION	AM POWER	SSB POWER
981-6238	Cut D501	T704,T705	

SHARK RADIOS

MODEL	MODULATION	AM POWER	SSB POWER
W-705	R207 or Cut D201	T204,L202,L205	

SUPERSTAR RADIOS

MODEL	MODULATION	AM POWER	SSB POWER
120 ¹	RV3 or Cut D9	L10,L11,L12,L13	
505F ²	VR5 or Cut D16	L4,L3,L2,L1	
TEK 505D	VR5 or Cut D16	L4,L3,L2,L1	
TEK 506D	RV203 or Cut R270	RV300	RV303

1. New Model Similiar to Tristar 120

2. Unit has Am/Fm, Factory Echo, and frequency Coverage from 26.055 to 28.755

Variable Alignments

SHARK W-705

R132 = Squelch Adjust

R153 = Receive Meter

R227 = Transmit Meter

C211 = 10.240 Xtal Adjust

SUPERSTAR 505F

RV1 = Receive Meter LED

RV2 = Transmit Meter LED

RV3 = Squelch Range Adjust

RV5 = Modulation AMC

RV6 = Fm Deviation

TC1 = 10.240 Freq. Adjust

TC2 = 10.695 Freq. Adjust

Receive Adjust = T1,T2,T3,T4,T5,T6

Transmit Adjust = L4,L3,L2,L1

SUPERSTAR TEK-505D

RV1 = Receive Meter LED

RV2 = Transmit Meter LED

RV3 = Squelch Range Adjust

RV5 = Modulation AMC

RV6 = Fm Deviation

TC1 = 10.240 Freq. Adjust

TC2 = 10.695 Freq. Adjust

Receive Adjust = T1,T2,T3,T4,T5,T6

Transmit Adjust = L4,L3,L2,L1

SUPERSTAR TEK-506D

RV1 = Squelch Adjust

RV101 = Receive RF Meter

RV202 = Fm Deviation

RV203 = Modulation Adjust

RV300 = Am Transmit Power

RV304 = Transmit RF Meter

RV303 = SSB Power Adjust

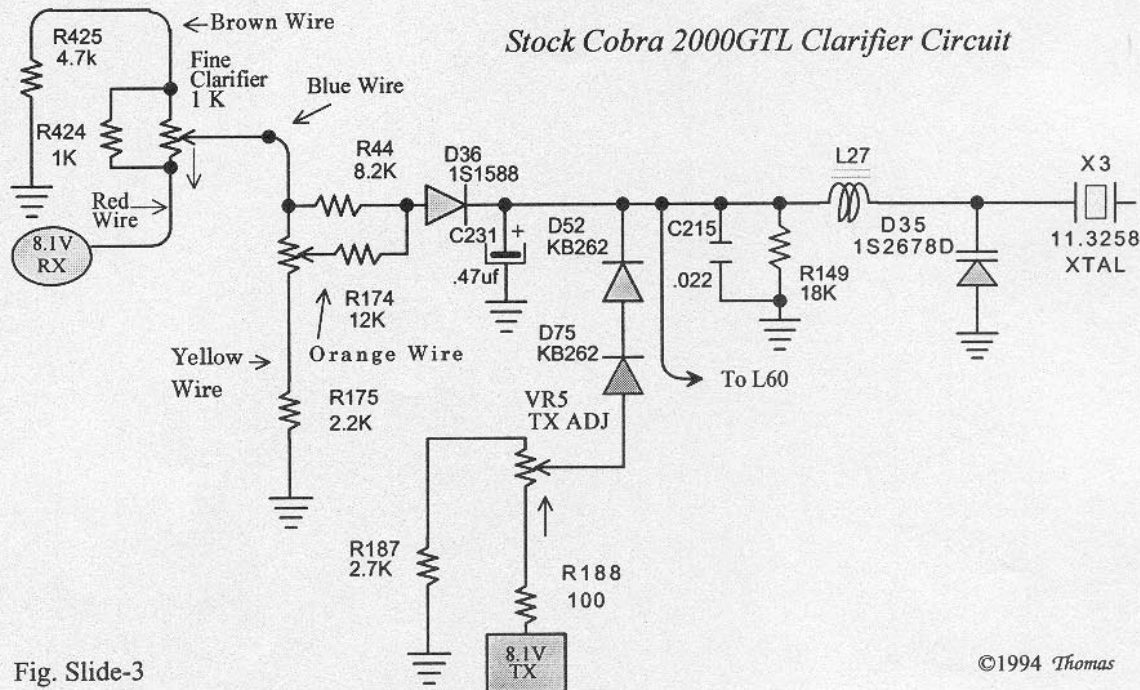
RV400 = Carrier Balance

Receive Adjust = T1,T2,T3,T4,T5,T6,T7,T8

Transmit Adjust = T302,T303,T304,L305,L306,L307

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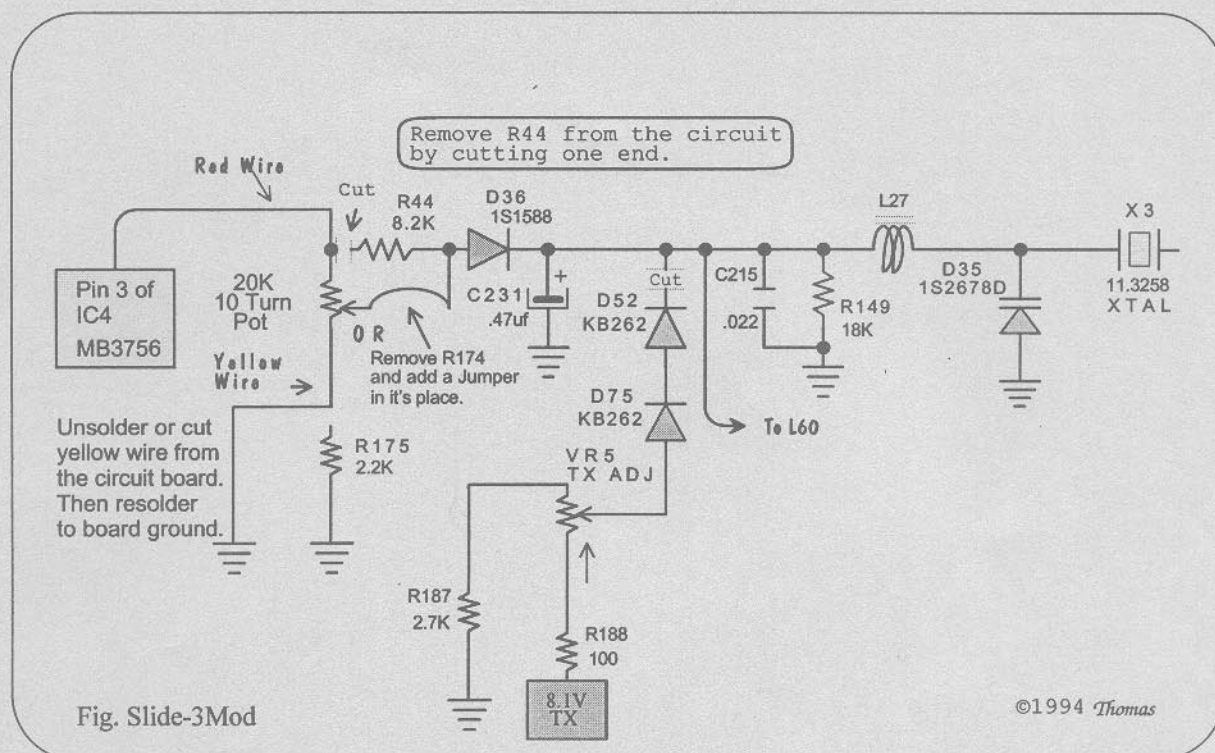
COBRA 2000GTL SUPER-SLIDE MODIFICATION



Installation Instructions

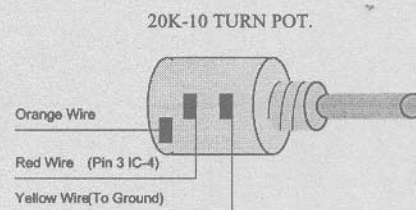
The above diagram above shows the stock clarifier circuit as the Cobra 2000GTL comes from the factory. In all cases once this circuit has been modified, the stock clarifier control is just not adequate for all practical purposes. Not only is it difficult to clarify, the unit will also tend to drift off frequency due to the lack of clarifier control stability. The cure for this problem is to install a 10-Turn Precision Potentiometer in place of the stock clarifier control. This will allow you cover the same range in 10 complete turns versus 1 turn with the stock control. Your clarifier will then operate like a FINE TUNE clarifier control and will have much improved stability, with very little or no frequency drift. On the next page we have shown what the above circuit should look like once modified and how to wire your new 20k - 10 turn pot in place of the stock clarifier control.

COBRA 2000GTL SUPER-SLIDE MODIFICATION



20K-10 Turn Pot Diagram & Installation Instructions

1. Cut the Brown wire loose from where it connects to the stock clarifier control and tape back. Next unsolder the Red Wire, Yellow Wire, and the Orange Wire from the stock clarifier control. At this point you will need to remove the old clarifier control and install the new 20K-10 turn in its place. Once that you have mounted the new pot, resolder the Red Wire, Yellow Wire, and the Orange Wire to the new 10 turn pot as shown in the diagram to the right.



2. Next trace the Yellow Wire to where it connects to the circuit board and cut it loose at this point. Strip the end of the Yellow Wire and solder it directly to the circuit board ground. Next trace the red wire from the clarifier control to where it connects to the circuit board and cut it loose at this point also. Once that you have cut the Red Wire loose, solder about an extra length of Red hookup wire to the end that you cut loose in order for it to reach Pin 3 of IC-4 (MB-3756 Regulator). Carefully solder the Red Wire to Pin 3, the unused pin of IC-4.

3. Next locate R174 (a 12K resistor) and unsolder and remove it from the circuit. Once removed put a wire jumper in its place and solder it in place. Next locate R44 (8.2K Resistor) and D52, and carefully cut one end of each component, thus effectively removing them from the circuit. It doesn't matter which end of R44 and D52 you cut. Once completed, your unit should now slide anywhere from 15 to 30 KHz, and be as smooth as silk..

COBRA 2000

Channel Conversion using 11.1125 Xtal

The Cobra 2000GTL comes from the factory with a n MB8734 PLL chip installed. This chip will need to be removed and replaced with an MB8719 PLL chip before proceeding with this conversion. We strongly recommend that you use an 18 pin IC socket when replacing the PLL chip. This will save direct soldering to the new MB8719 chip and will help eliminate possible damage to the new chip.

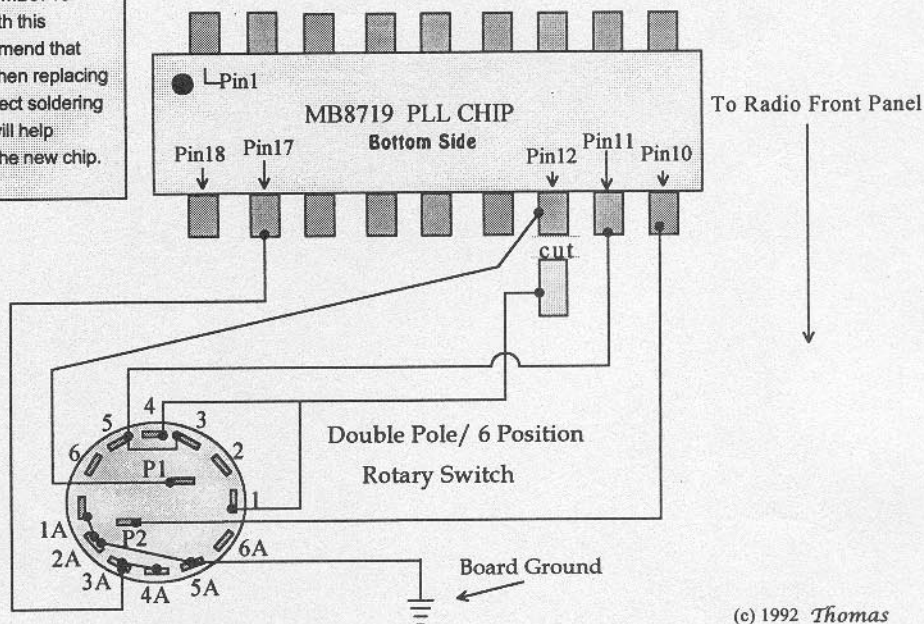


Fig. 2000ROT

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Instructions

1. Locate and change X3, the 11.3258 crystal to a 11.1125 crystal. This is the same crystal used in the Cobra 142GTL and Uniden Washington. Next obtain a Double Pole / 6 Position Rotary Switch. Refer to the above diagram. Note that Pin 3 & Pin 5 are tied together, Pins 1 & Pin 4 are tied together, Pins 3A & Pin 4A are tied together, and that Pins 1A, 2A, and 5A are also tied together. You will need to solder small jumpers across these pins as shown. Next obtain a piece of 6 wire ribbon wire and wire to the switch as shown in the above diagram. Be sure to use a long enough piece of wire in order to reach from the switch to the PLL once the switch is installed in it's permanent location. Note which color of wire goes to the switch pins in order to make it easier when connecting the other end to the PLL Chip.
2. Next using an ex-acto knife carefully cut and isolate Pin 12 of the MB8719 PLL chip. Be sure to isolate just this pin. Once this has been done, connect the wires from the switch to the correct locations as shown in the above diagram, and then mount the switch. Refer to the channels on the next page and check each position of the switch for these channels. You will probably find that some do not match. If this is the case you will need to carefully tweak L21 (Tripler Can) until all channels are there. This is a very critical Adjustment in order for this modification to work with the 11.1125 crystal. Usually just a small amount of adjustment is needed.

COBRA 2000 CHANNEL CHART USING 11.1125 XTAL

POSITION #1 = Normal Channels

POSITION #2 =

23 = 27.415	26 = 27.425	27 = 27.435	28 = 27.445
-------------	-------------	-------------	-------------

POSITION #3 =

1 = 27.605	8 = 27.535	14 = 27.605	21 = 28.015
2 = 27.455	9 = 27.545	15 = 27.935	22 = 28.025
3 = 27.465	10 = 27.555	16 = 27.955	23 = 28.055
4 = 27.485	11 = 27.565	17 = 27.965	24 = 28.035
5 = 27.495	12 = 27.585	18 = 27.975	25 = 28.045
6 = 27.505	13 = 27.595	19 = 27.985	26 = 28.065
7 = 27.515	14 = 27.605	20 = 28.005	27 = 28.075
			28 = 28.085

POSITION #4

1 = 27.605	11 = 27.725	21 = 27.855	31 = 27.955
2 = 27.615	12 = 27.745	22 = 27.865	32 = 27.965
3 = 27.625	13 = 27.755	23 = 27.895	33 = 27.975
4 = 27.645	14 = 27.765	24 = 27.875	34 = 27.985
5 = 27.655	15 = 27.775	25 = 27.885	35 = 27.995
6 = 27.665	16 = 27.795	26 = 27.905	36 = 28.005
7 = 27.675	17 = 27.805	27 = 27.915	37 = 28.015
8 = 27.695	18 = 27.815	28 = 27.925	38 = 28.025
9 = 27.705	19 = 27.825	29 = 27.935	39 = 28.035
10 = 27.715	20 = 27.845	30 = 27.945	40 = 28.045

POSITION #5 =

2 = 26.815	5 = 26.855	8 = 26.895	11 = 26.925
3 = 26.835	6 = 26.865	9 = 26.905	12 = 26.945
4 = 26.845	7 = 26.875	10 = 26.915	13 = 26.955
			14 = 26.965(Ch1)

POSITION #6 =

1 = 26.485	11 = 26.445	21 = 26.735	31 = 26.675
2 = 26.335	12 = 26.465	22 = 26.745	32 = 26.685
3 = 26.345	13 = 26.475	23 = 26.775	33 = 26.695
4 = 26.365	14 = 26.485	24 = 26.755	34 = 26.705
5 = 26.375	15 = 26.655	25 = 26.765	35 = 26.715
6 = 26.385	16 = 26.675	26 = 26.785	36 = 26.725
7 = 26.395	17 = 26.685	27 = 26.795	37 = 26.735
8 = 26.415	18 = 26.695	28 = 26.805	38 = 26.745
9 = 26.425	19 = 26.705	29 = 26.655	39 = 26.755
10 = 26.435	20 = 26.725	30 = 26.665	40 = 26.765

COBRA 2000GTL

SUPER-TALK Installation Instructions

COBRA 2000GTL w/ SUPER-TALK Installed

Adds variable talk power for both AM and SSB modes.

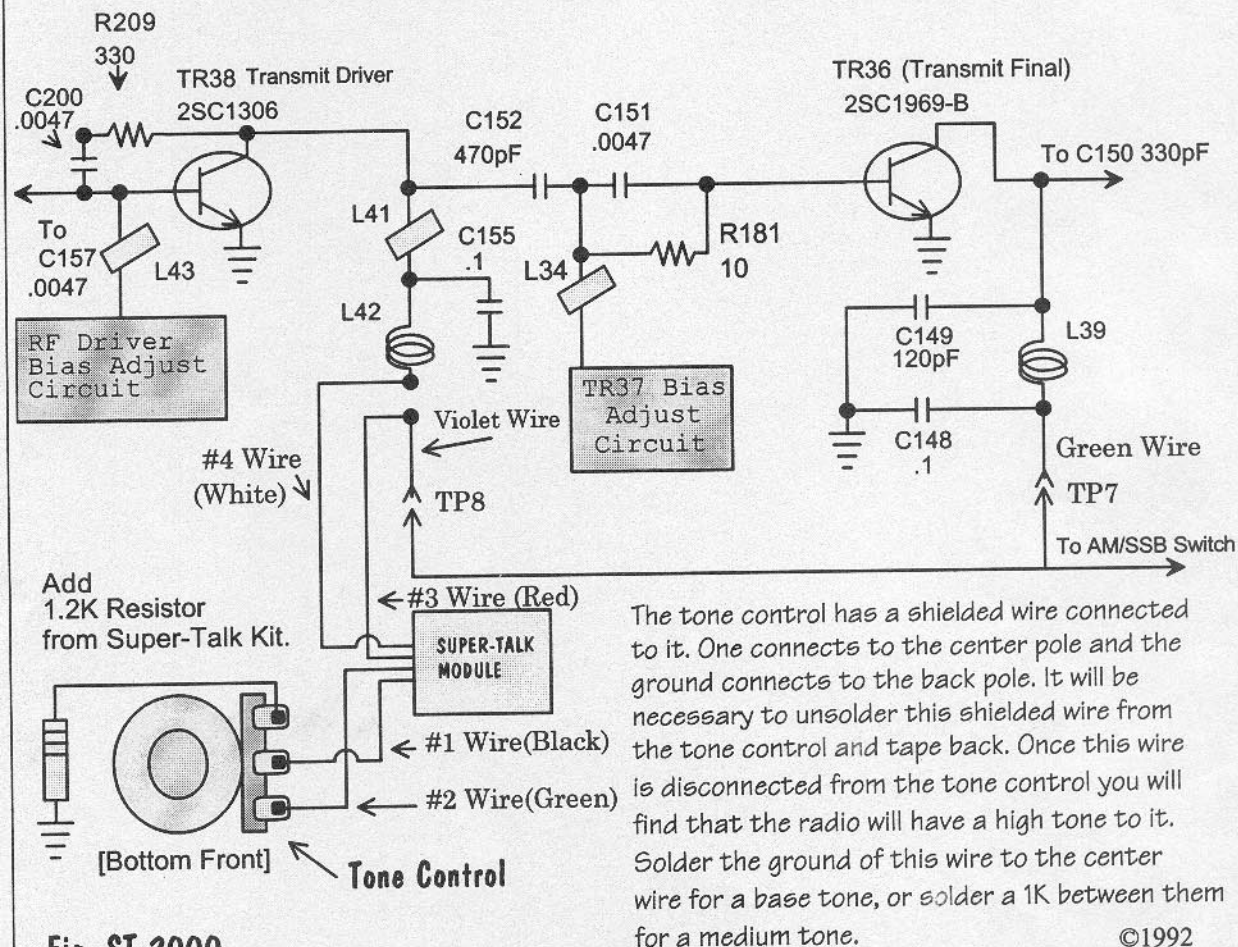


Fig. ST-2000

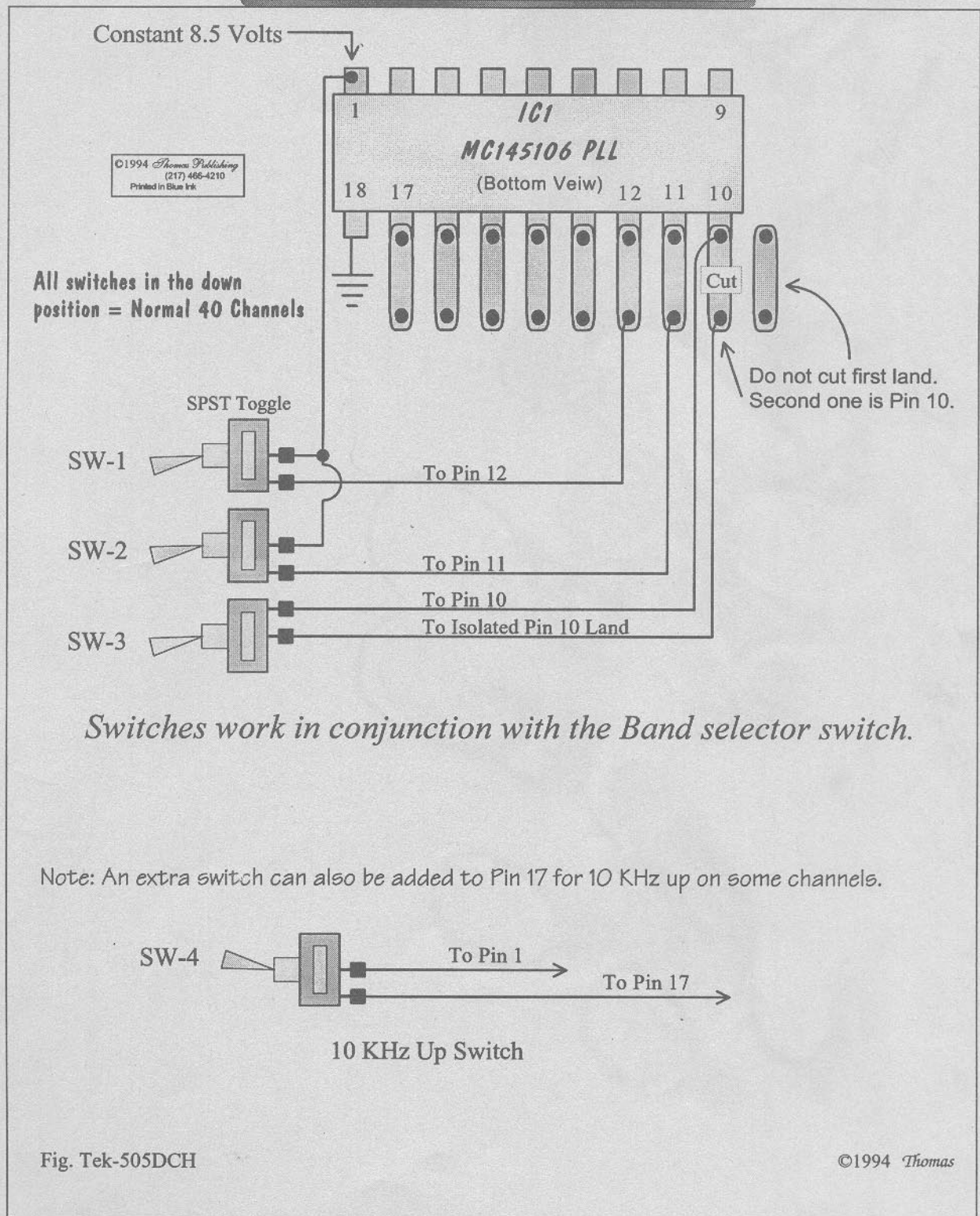
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Installation Instructions

1. Remove the radio's top and bottom covers and set aside. Next locate TP8. This test point has a Violet wire coming from it, going back towards the radio driver. It connects to the board at L42. Next cut the violet wire about 2 inches back from L42. This is where you will add the **SUPER-TALK™** module to the circuit. Refer to the diagram above and connect the wires as shown. Once that you have connected the #3 (Red Wire) and the #4 (White Wire) to the cut violet wire, proceed to hook the #1 (Black Wire) and the #2 (Green Wire) to the Tone Control as illustrated. Next add the 1.2K resistor to the remaining pole and connect the other end to the board ground.

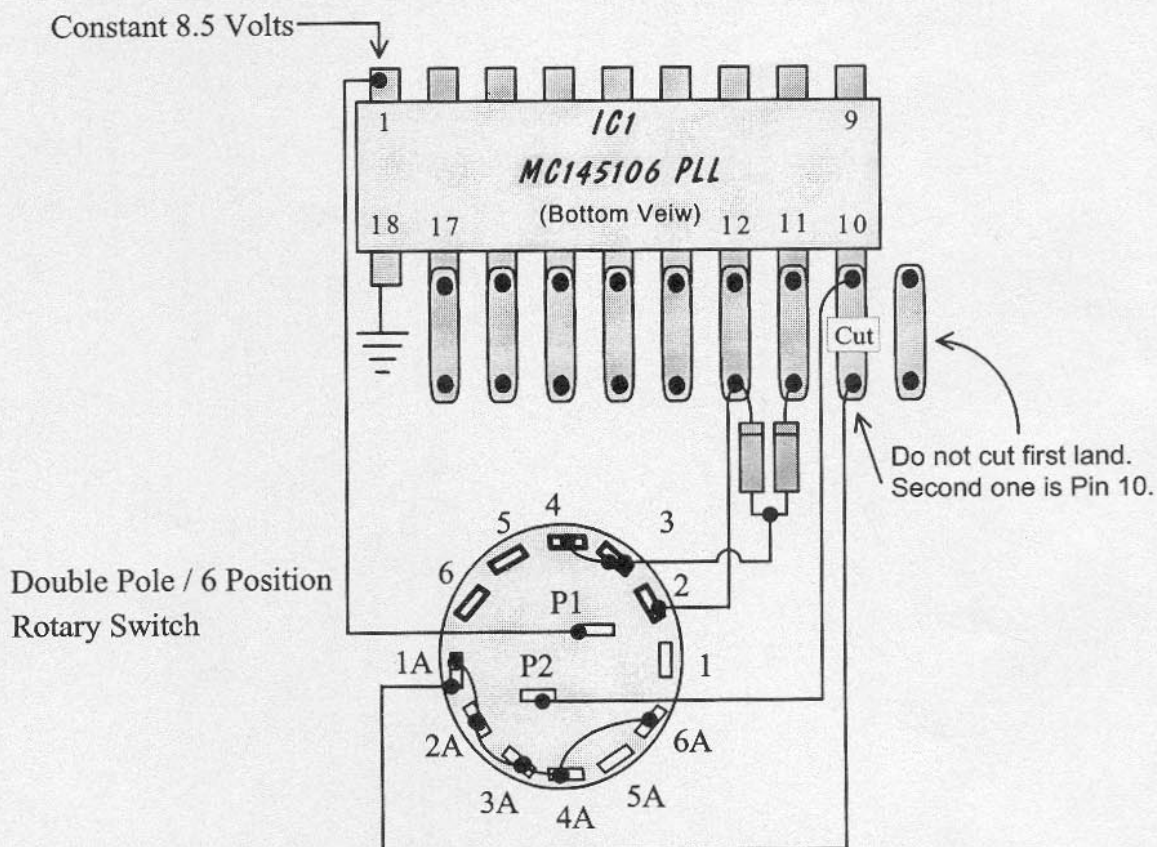
SUPERSTAR TEK 505D

Switch Channel Conversion



SUPERSTAR TEK 505D

Rotary Switch Channel Conversion



Rotary Switch works in conjunction with the Band selector switch.

Note: An extra switch can also be added to Pin 17 for 10 KHz up on some channels.

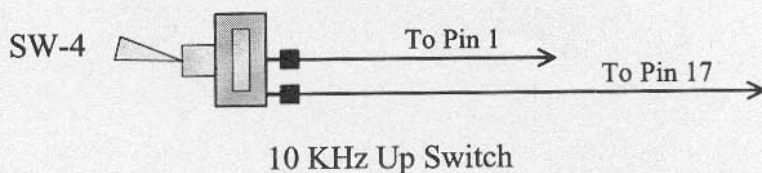


Fig. Tek-505DCH

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TEK-505D

CHANNEL CHART

[ROTARY] POSITION #1 = Normal Channels

[SWITCH] SW-1 Down , SW-2 Down & SW-3 Down = Normal Channels

[ROTARY] POSITION #2 & HI Band Position =

[SWITCH] SW-1 Up & SW-2 Down & SW-3 Down & Hi Band Position =

1 = 27.735	6 = 27.795	11 = 27.855	16 = 27.925
2 = 27.745	7 = 27.805	12 = 27.875	17 = 27.935
3 = 27.755	8 = 27.825	13 = 27.885	18 = 27.945
4 = 27.775	9 = 27.835	14 = 27.895	19 = 27.955
5 = 27.785	10 = 27.845	15 = 27.905	

[ROTARY] POSITION #3 & MID Band Position =

[SWITCH] SW-1 Up , SW-2 Up , SW-3 DOWN & Mid Band Position =

33 = 27.605	35 = 27.995	37 = 28.015	39 = 28.035
34 = 27.455	36 = 28.005	38 = 28.025	40 = 28.045

[ROTARY] POSITION #4 & HI Band Position =

[SWITCH] SW-1 Up , SW-2 Up , SW-3 Down & Hi Band Position =

1 = 28.055	6 = 28.115	11 = 28.175	16 = 28.245
2 = 28.065	7 = 28.125	12 = 28.195	17 = 28.255
3 = 28.075	8 = 28.145	13 = 28.205	18 = 28.265
4 = 28.095	9 = 28.155	14 = 28.215	19 = 28.275
5 = 28.105	10 = 28.165	15 = 28.225	

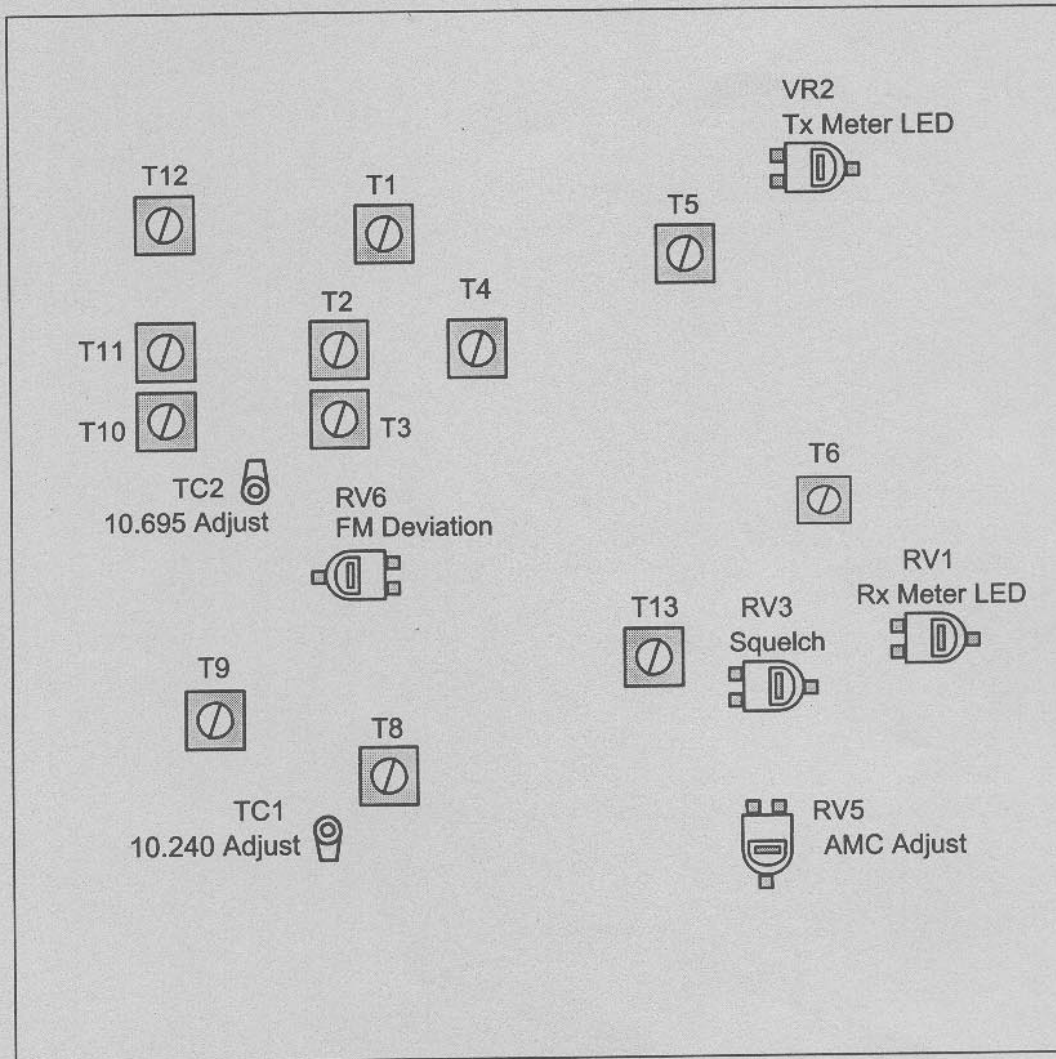
[ROTARY] POSITION #5 & HI Band Position =

[SWITCH] SW-1 Down , SW-2 Down , SW-3 Up & Hi Band Positon =

11 = 26.255	19 = 26.355	27 = 26.445	35 = 26.525
12 = 26.275	20 = 26.375	28 = 26.455	36 = 26.535
13 = 26.285	21 = 26.385	29 = 26.465	37 = 26.545
14 = 26.295	22 = 26.395	30 = 26.475	38 = 26.555
15 = 26.305	23 = 26.425	31 = 26.485	39 = 26.565
16 = 26.325	24 = 26.405	32 = 26.495	40 = 26.575
17 = 26.335	25 = 26.415	33 = 26.505	
18 = 26.345	26 = 26.435	34 = 26.515	

SUPERSTAR TEK 505D

Alignment Layout



TEST EQUIPMENT TO USE & CONNECTION	RADIO SETTINGS		INSTRUCTIONS
	Channel	Mode	
Connect Oscilloscope to the junction of L8 secondary and C143	19	AM	Adjust T8 for maximum RF
Connect frequency counter to the junction of L8 secondary and C143	19	AM	Adjust TC-1 for 10.240 MHz ± 0.01 Hz
Connect frequency counter to pin 1 of IC 2 KIA-7310 chip	19	AM Transmit	Adjust TC2 for 10.695 MHz ± 0.01 Hz
Connect frequency counter to the junction of C7 and the base of Q2			Check for: CH 1 = 16.270 CH 20 = 16.510 CH 40 = 16.710

SUPERSTAR TEK 505D						
Voltage Chart						
/ = Squelched / Unsquelched () = RF GAIN Fully counterclockwise						
TRANSISTOR	CONFIGURATION	PIN	AM RX	AM TX	FM RX	FM TX
Q1 1st RF Amp	 KTC-1923-O	E C B	0.26 (0.22) 7.64 (7.65) 1.72 (0.33)			
Q2 1st Mixer	 KTC-1923-O	E C B	1.10 11.80 1.02			
Q3 2nd Mixer	 KTC-1923-O	E C B	0.16 7.28 0.77			
Q4 1st IF Amp	 KTC-1815-O	E C B	0.00 2.28 0.78			
Q5 2nd IF Amp	 KTC-1815-O	E C B	1.60 12.29 2.28			
Q6 Noise Blanker	 KTC-1923-O	E C B	0.06 4.01 0.80			
Q7 Noise Blanker (Voltages with NB on)	 KTC-1266 or KTC-1015Y	E C B	12.31 0.00 12.52			
Q8 Noise Blanker	 KTC-1815-Y	E C B	0.06 0.00 0.01			
Q9 Mike Amp	 KTC-3198-Y	E C B	10.73 11.20 10.60	1.18 4.30 1.86		1.18 4.30 1.86
Q10 Audio Amp	 KTC-3199-Y	E C B	0.07 0.09 0.78	0.13 0.08 0.69		0.13 0.08 0.69
Q11 Audio Amp	 KTC-3198-Y	E C B	0.07 0.06 0.07	0.13 0.04 0.00		
Q14 Transmit Oscillator	 KTC-1923-O	E C B	0.23 1.12 0.89	3.46 7.94 3.94		

SUPERSTAR TEK 505D

Voltage Chart

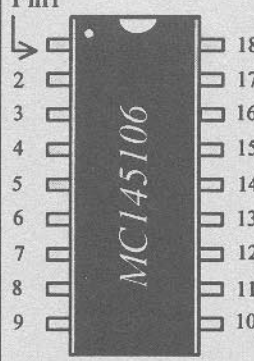
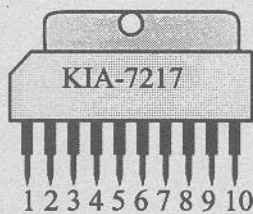
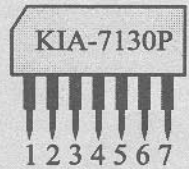
/ = Squelched / Unsquelched () = RF GAIN Fully counterclockwise

TRANSISTOR	CONFIGURATION	PIN	AM RX	AM TX	FM RX	FM TX
Q15 Regulator	 KTC-1815-GR E C B or KTC-3198-Y	E C B	8.57 12.20 9.30	8.65 11.90 9.30		
Q16 Transmit Switch	 KTC-1266 or E C B KTC-1015Y	E C B	8.50 1.24 8.50	8.65 8.54 7.80		
Q17 Transmit Switch	 KTC-1815-GR E C B or KTC-3198-Y	E C B	7.73 8.62 8.47	0.51 8.65 0.90		
Q18 Transmit Mixer / Buffer	 KTC-380-O E C B	E C B		1.11 10.60 1.68		
Q19 Transmit Driver	 2SC2314	E C B		0.00 6.80 0.07		
Q20 Transmit Final	 2SC2078	E C B		0.00 7.80 0.02		
Q21	 KTC-1266 or E C B KTC-1015Y	E C B	13.71 0.01 13.71	7.60 7.71 7.04		
Q22	 KTC-1815-GR E C B or KTC-3198-Y	E C B			0.13 0.19 0.18	1.99 5.36 1.99
Q23	 KTC-1815-GR E C B or KTC-3198-Y	E C B			0.16 0.13 0.13	1.60 3.90 2.25
Q24	 KTC-1815-GR E C B or KTC-3198-Y	E C B	2.25 7.64 2.34		0.14 0.14 0.14	

--- NOTES ---

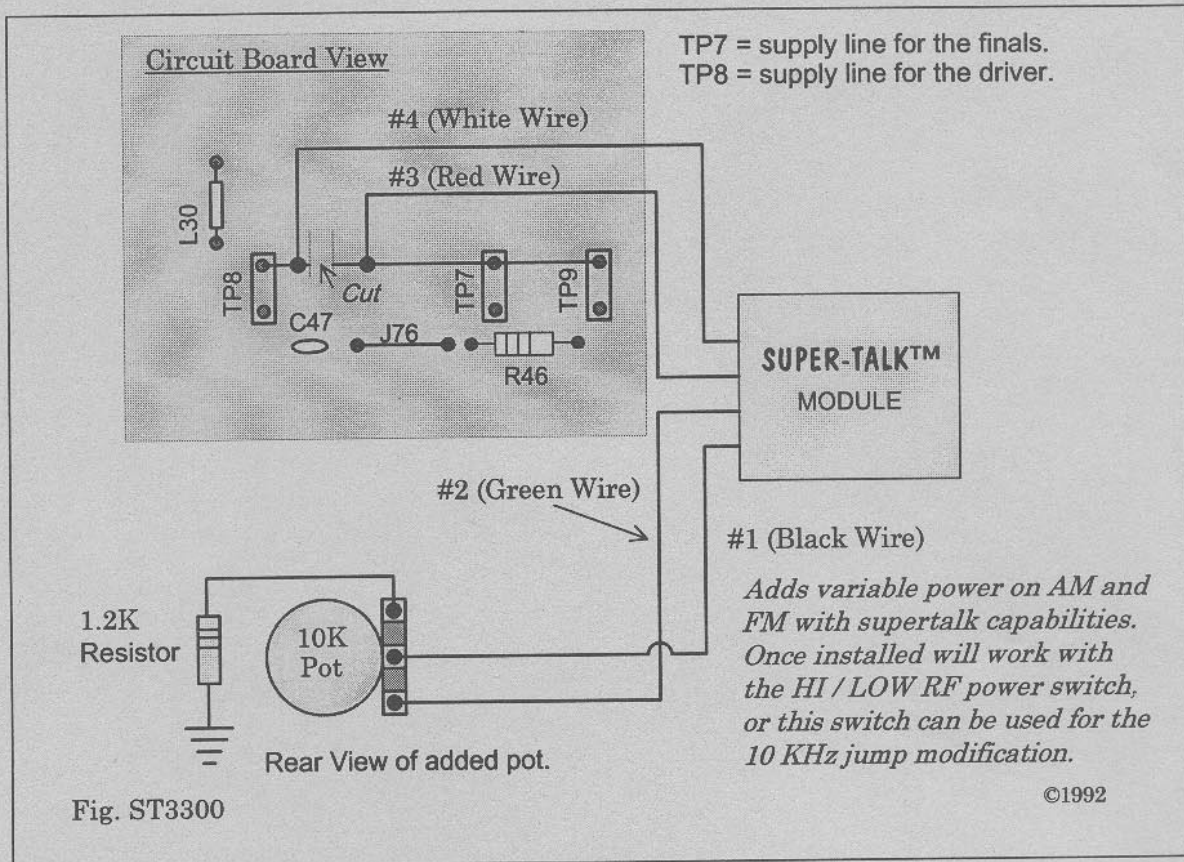
SUPERSTAR TEK 505D

IC Voltage Chart

IC NUMBER	CONFIGURATION	PIN	AM RX	AM TX	FM RX	FM TX
IC1 MC145106 PLL Chip <i>Radio Settings</i> Mid Band Channel 1	 MC145106 Pin 1 Phase-Locked Loop Chip 9 Bit Binary w/Internal Pull Down Resistors on P0 thru P8.	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18	8.52 4.10 4.10 3.90 3.90 8.40 1.85 8.20 0.00 0.16 8.48 0.16 8.48 8.48 0.16 8.48 8.48 0.00			
IC2 KIA-7310 VCO & TX MIXER Substitue = ECG1192	 KIA-7310 1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	2.83 2.12 1.51 1.58 0.00 1.15 2.27 6.73 1.27	2.76 2.05 1.62 2.87 0.00 7.83 2.29 6.94 8.47	IC PIN FUNCTIONS 1. Oscillator 2. Mixer Input 3. 16 Mhz output to Rx 4. Mixer Input 5. Ground 6. Mixer Output 7. Diff. Amp Input 8. VCC 9. Diff. Amp Output Pin 3 = 16.510 on Ch. 20 Pin 9 = 27.205 on Ch. 20	
IC3 KIA-7217 AUDIO AMP	 KIA-7217 1 2 3 4 5 6 7 8 9 10	1 2 3 4 5 6 7 8 9 10	13.80 12.46 4.04 8.21 1.55 3.46 3.48 1.32 0.00 6.90			
IC4 FM IF MAP	 KIA-7130P 1 2 3 4 5 6 7	1 2 3 4 5 6 7	1.89 1.89 5.56 0.00 3.06 3.10 4.46	0.00 0.10 0.42 0.00 0.14 0.12 0.13	IC PIN FUNCTIONS 1. Input 2. Feed Back 3. VCC 4. Ground 5. Detector Tank Circuit 6. Detector 7. Output	

CONNEX 3300

SUPER-TALK™ Installation Instructions

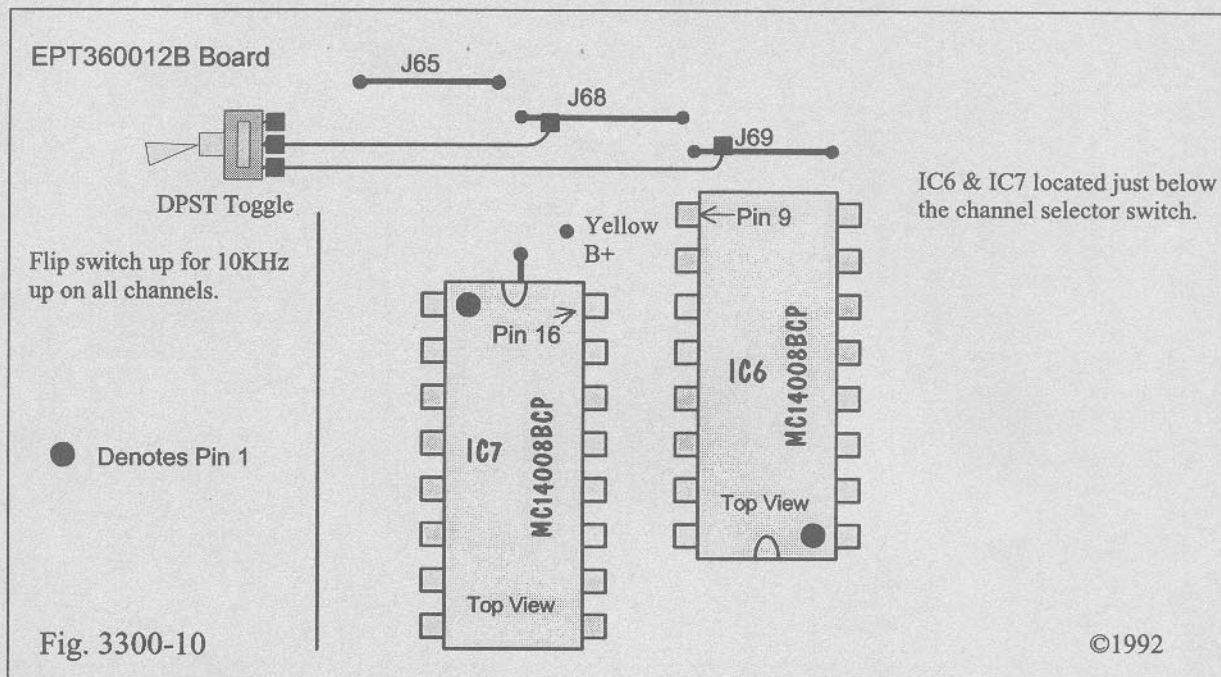


Installation Instructions

1. Locate the wire jumper running between TP7 and TP8 in the final area. Next make the cut as shown in the above diagram. Then solder the #4 white wire of the SUPER-TALK module to the part of the wire jumper going to TP8. Solder the #3 red wire to the part of the jumper going to TP7.
2. Next mount a miniature 10K pot in a convenient location. Usually there is a hole available on the side of the radio just in back of the channel selector. Once installed solder the balance of the SUPER-TALK wires as shown in the above diagram, and add the 1.2K resistor. Once installed you will have total variable power capabilities, and a clearer sounding echo with a lot more punch.

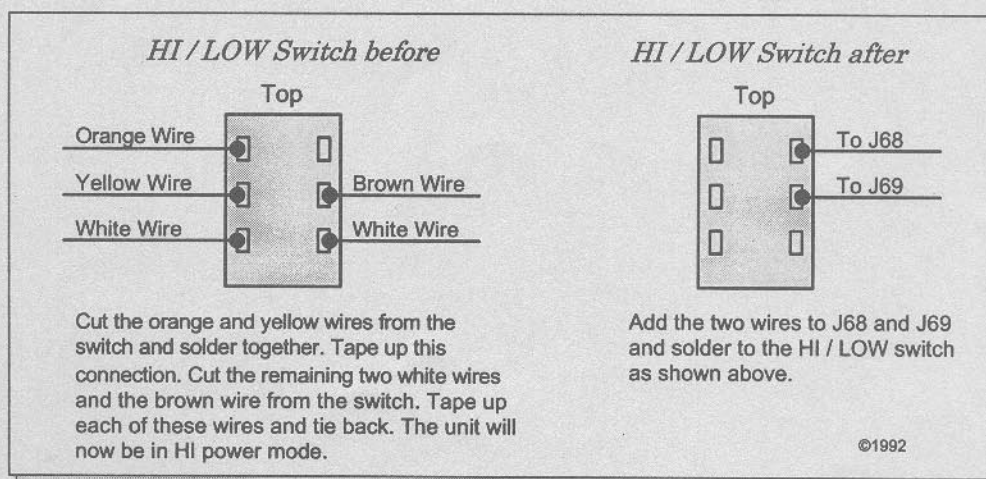
CONNEX 3300

+10 KHz Frequency Jump Modification



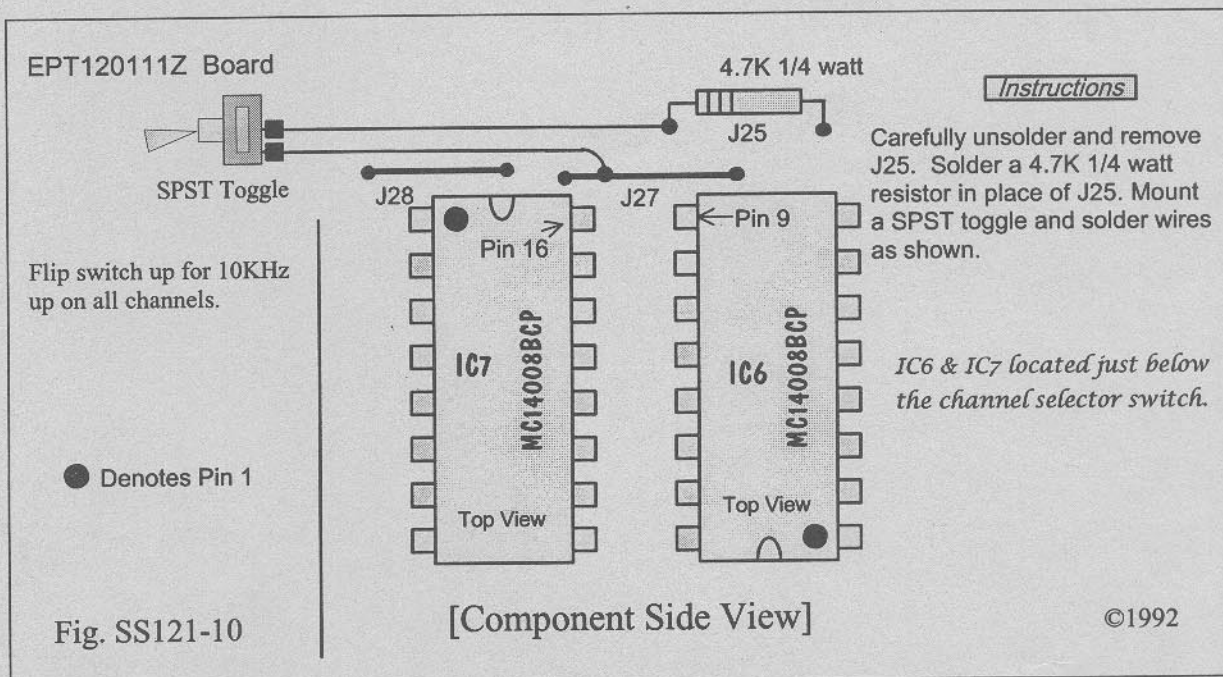
Installation Instructions

1. Mount a SPST toggle switch in any convenient location, or use the RF HI / LOW power switch if you have installed the SUPER-TALK module. Wire as shown. The unit will now go up 10KHz in frequency when this switch is flipped and allow coverage of most missed channels.



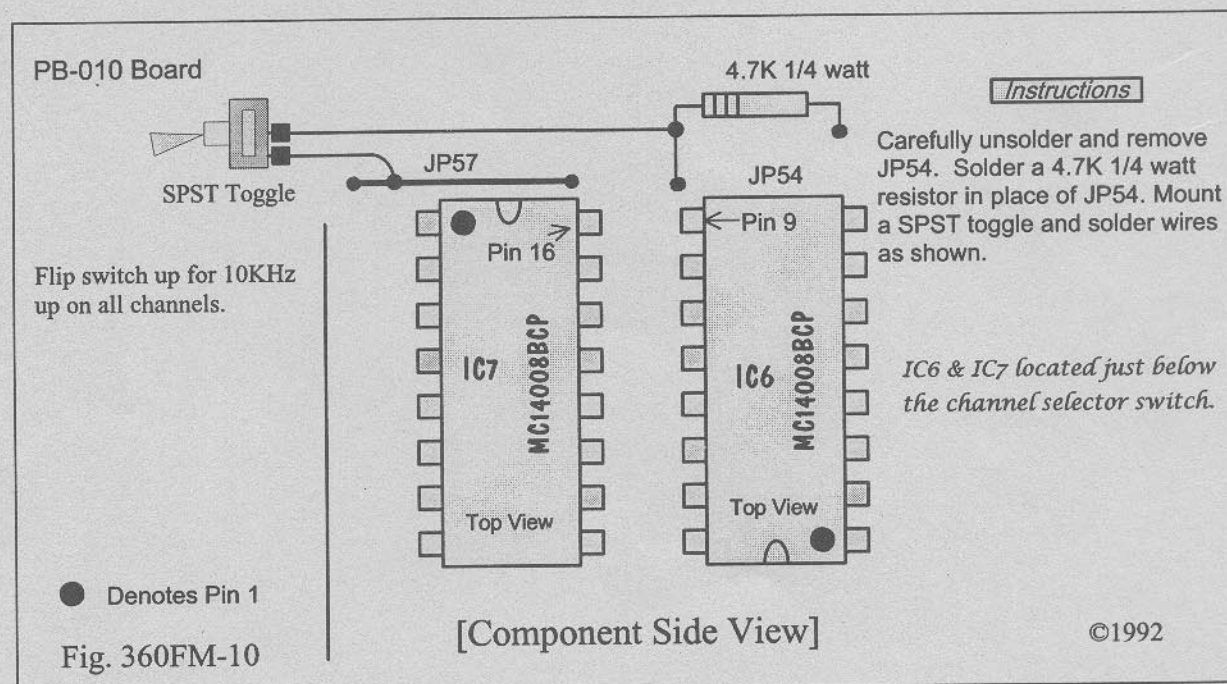
SUPERSTAR 121

+10 KHz Frequency Jump Modification



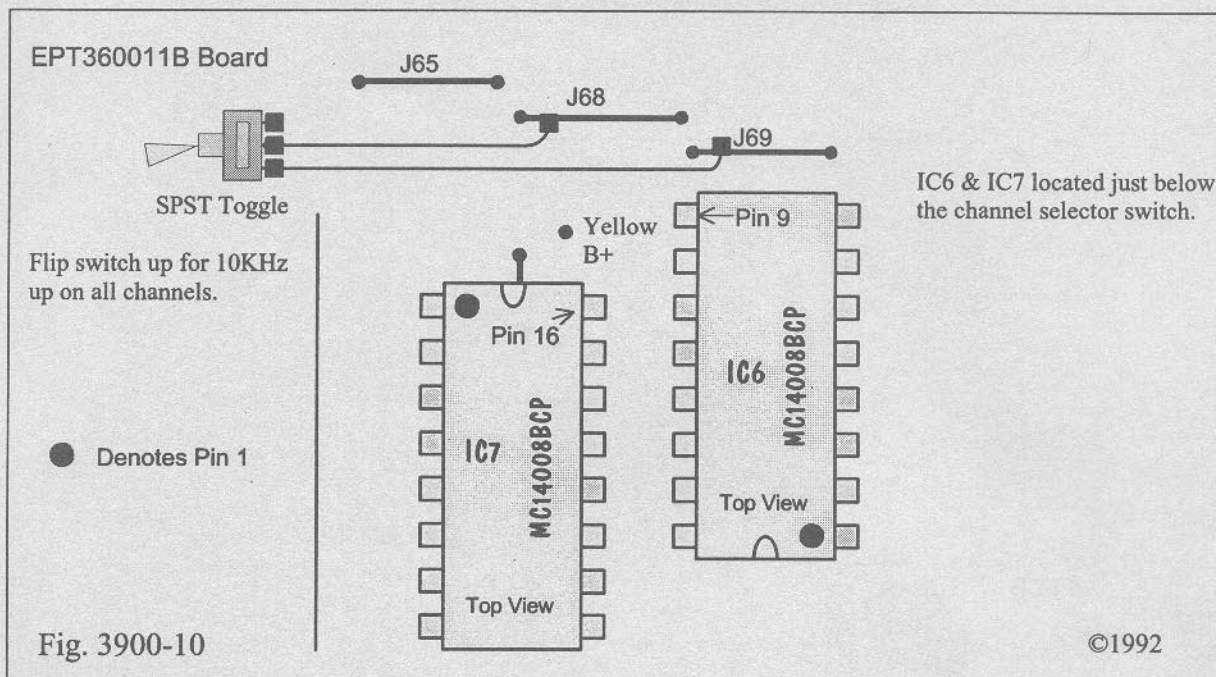
SUPERSTAR 360FM

+10 KHz Frequency Jump Modification



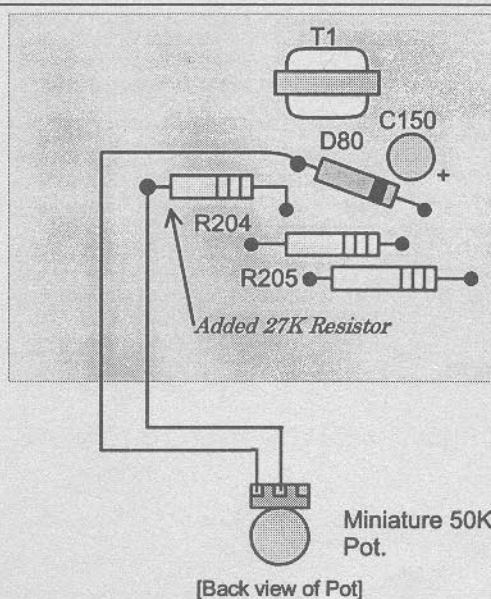
SUPERSTAR 3900

+10 KHz Frequency Jump Modification



SUPERSTAR 3900

Adding Variable Talk Back Capabilities



Installation Instructions

Locate D80 in the audio section and unsolder and lift one end so as to clear it from the circuit board as shown.

Next obtain a 27K 1/4 watt resistor and insert one end into the hole that D80 was just unsoldered from. Solder the new connection on the 27K resistor.

Next you will need to mount a miniature 50K pot in a convenient location. Next using two pieces of hook-up, wire the pot to D80 and the new 27K resistor as shown.

Once completed you should now have variable talk back controlled directly from the radio.

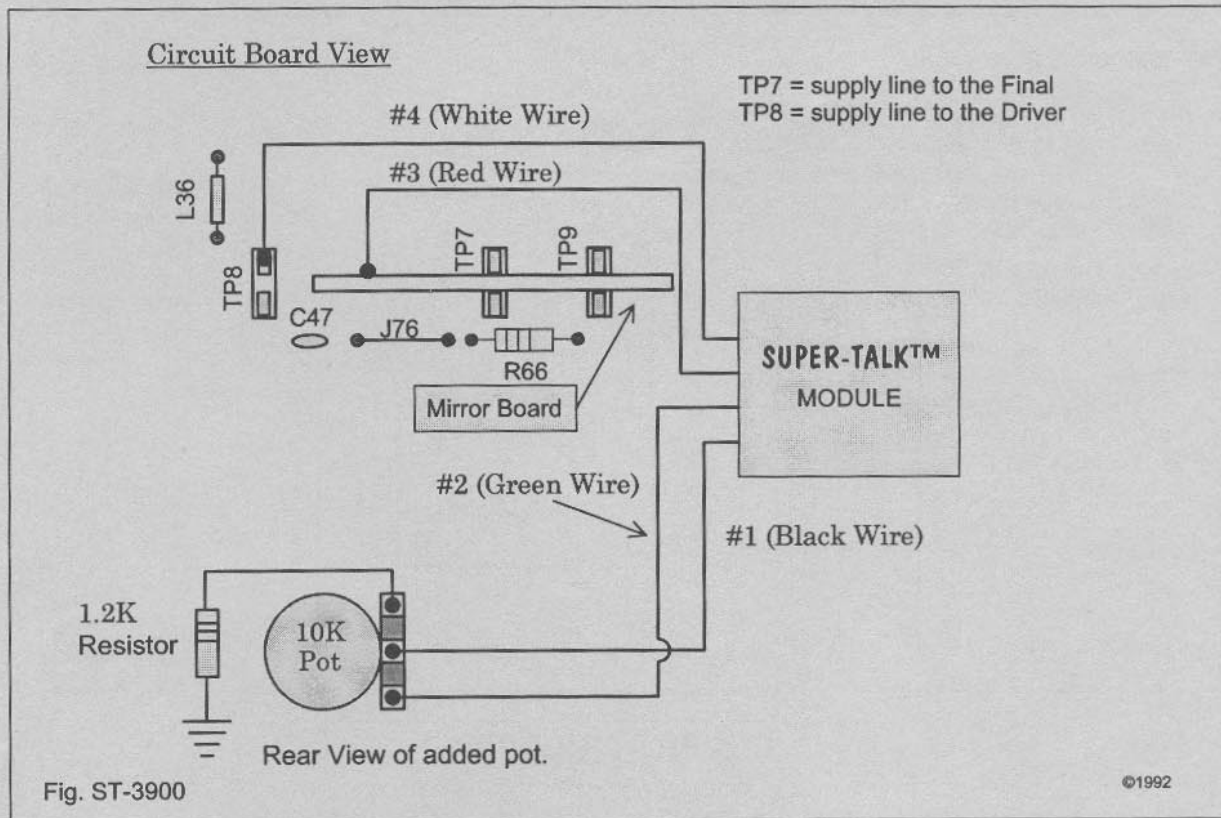
Note: This modification will also work with many other Export Radios that use this same basic circuit. Superstar 3600, Galaxy 2100, Texas Star 2100, Excalibur SSB, Galaxy Jupiter, to name a few. Some units have D90 instead of D80 but are the same.

Fig. 3900-Var

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SUPERSTAR 3900

SUPER-TALK™ Installation Instructions



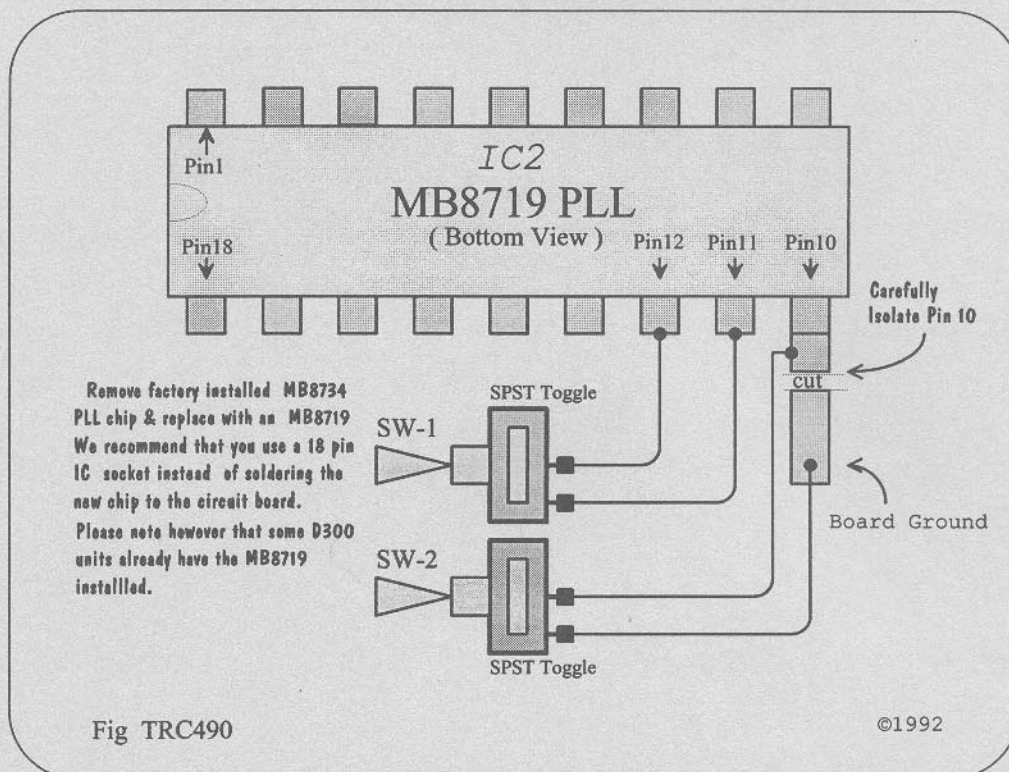
Installation Instructions

1. Locate the mirror board that connects TP9, TP8, and TP7 in the final section. Next slide this board to the right until it no longer makes a connection with TP8. Then solder the #4 white wire to the TP8 terminal and solder the #3 red wire directly to the side of the mirror board. Make sure that your solder connections are good and solid.
2. Next mount a 10K miniature pot in a convenient location and solder the other two wires of the SUPER-TALK module as shown in Fig. ST-3900. Next add the 1.2K resistor to the remaining pole. Your 3900 will now have variable power on all transmit modes.

Note: This SUPER-TALK installation is basically the same for many other Export and Domestic CB radios with the removable mirror board. It is important however that when you slide the mirror board over that it does not short against any other components. If you find that this is the case, insulate the end of the board with some electrical tape before proceeding with the installation.

REALISTIC TRC-490 & TRAM D300

Channel Conversion



Instructions

1. Unsolder and replace the MB8734 PLL IC with a new MB8719 IC Chip. We recommend the use of a IC socket when replacing any Integrated Circuit for safety. Refer to the diagram above, and locate pin 10 of the newly installed MB8719 PLL chip. Notice that it is connected to ground. Make a small cut and totally isolate this pin from ground. You will need to isolate both sides of pin 10, and then connect a jumper across these cuts in order to tie just the two ground sides back together. (Do not reconnect Pin 10). Make sure that once this has been done that pin 10 is totally isolated. Next, turn the radio on and check to make sure that you have all of the normal channels and that the frequencies are correct before proceeding. If necessary adjust CT3 for USB first, then L19 for LSB, and L20 for Am while the clarifier is set to center slot. { This conversion is basically the same as the conversions for the Cobra 2000 . You could also use the Rotary Switch Conversion shown in Master Edition Volume III on page 16 for either of these units. }

2. Next mount your switches and wire them up as shown in Fig TRC490 above. Be sure to check all of your connections before proceeding. Refer to the Channel Chart on the following page for your new frequencies.

Note : Some of the older MB8719 Chips have the dot marking on pin 18. The newer MB8719 chips have the dot marking on pin 1. Regardless pin 1 is always the first pin to the top of the indentation marking on one end when viewed from the bottom side of the circuit board as shown above in Fig. TRC490.

TRC-490 & TRAM D300

FREQUENCY CHART

POSITION #1 SW-1 DOWN and SW-2 DOWN = Normal Channels

POSITION #2 SW-1 UP and SW-2 DOWN =

15 = 26.815	20 = 26.885	25 = 26.925	30 = 26.985 (Ch3)
16 = 26.835	21 = 26.895	26 = 26.945	31 = 26.995 (3A)
17 = 26.845	22 = 26.905	27 = 26.955	32 = 27.005 (Ch4)
18 = 26.855	23 = 26.935	28 = 26.965 (Ch1)	
19 = 26.865	24 = 26.915	29 = 26.975 (Ch2)	

POSITION #3 SW-1 UP and SW-2 UP =

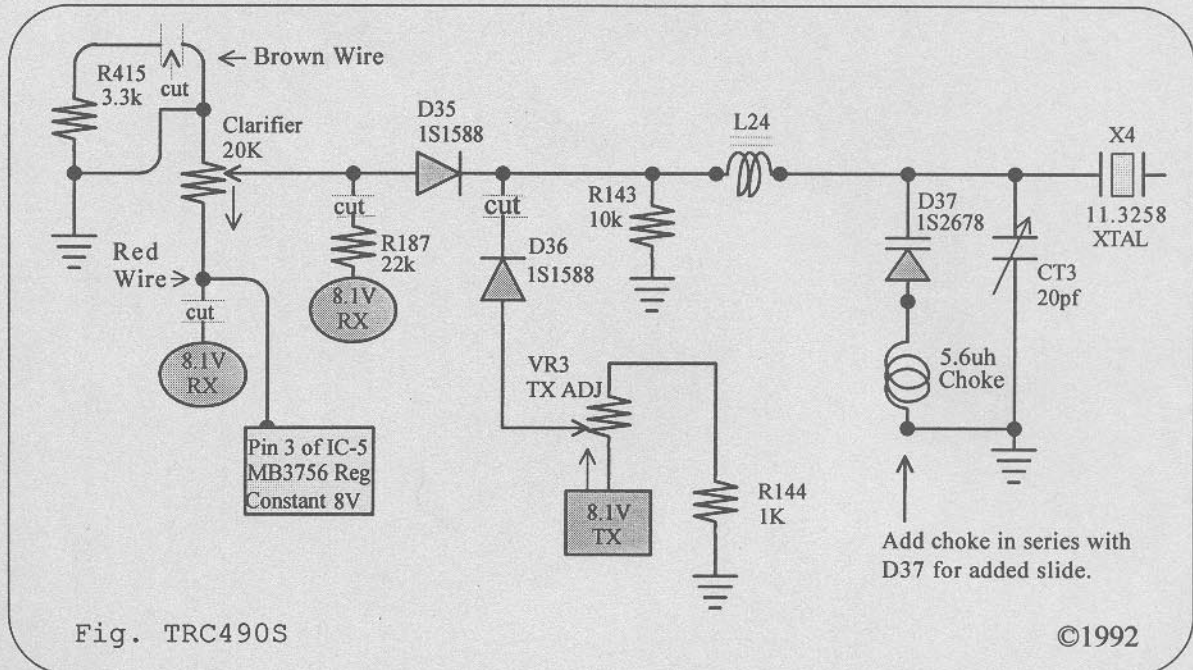
1 = 27.605	6 = 27.505	10 = 27.555	14 = 27.605
2 = 27.455	7 = 27.515	11 = 27.565	16 = 27.475
3 = 27.465	8 = 27.535	12 = 27.585	20 = 27.525
4 = 27.485	9 = 27.545	13 = 27.595	23 = 27.575
5 = 27.495			

POSITION #4 SW-1 Down and SW-2 UP =

1 = 27.605	11 = 27.725	21 = 27.855	31 = 27.955
2 = 27.615	12 = 27.745	22 = 27.865	32 = 27.965
3 = 27.625	13 = 27.755	23 = 27.895	33 = 27.975
4 = 27.645	14 = 27.765	24 = 27.875	34 = 27.985
5 = 27.655	15 = 27.775	25 = 27.885	35 = 27.995
6 = 27.665	16 = 27.795	26 = 27.905	36 = 28.005
7 = 27.675	17 = 27.805	27 = 27.915	37 = 28.015
8 = 27.695	18 = 27.815	28 = 27.925	38 = 28.025
9 = 27.705	19 = 27.825	29 = 27.935	39 = 28.035
10 = 27.715	20 = 27.845	30 = 27.945	40 = 28.045

REALISTIC TRC-490 & TRAM D300

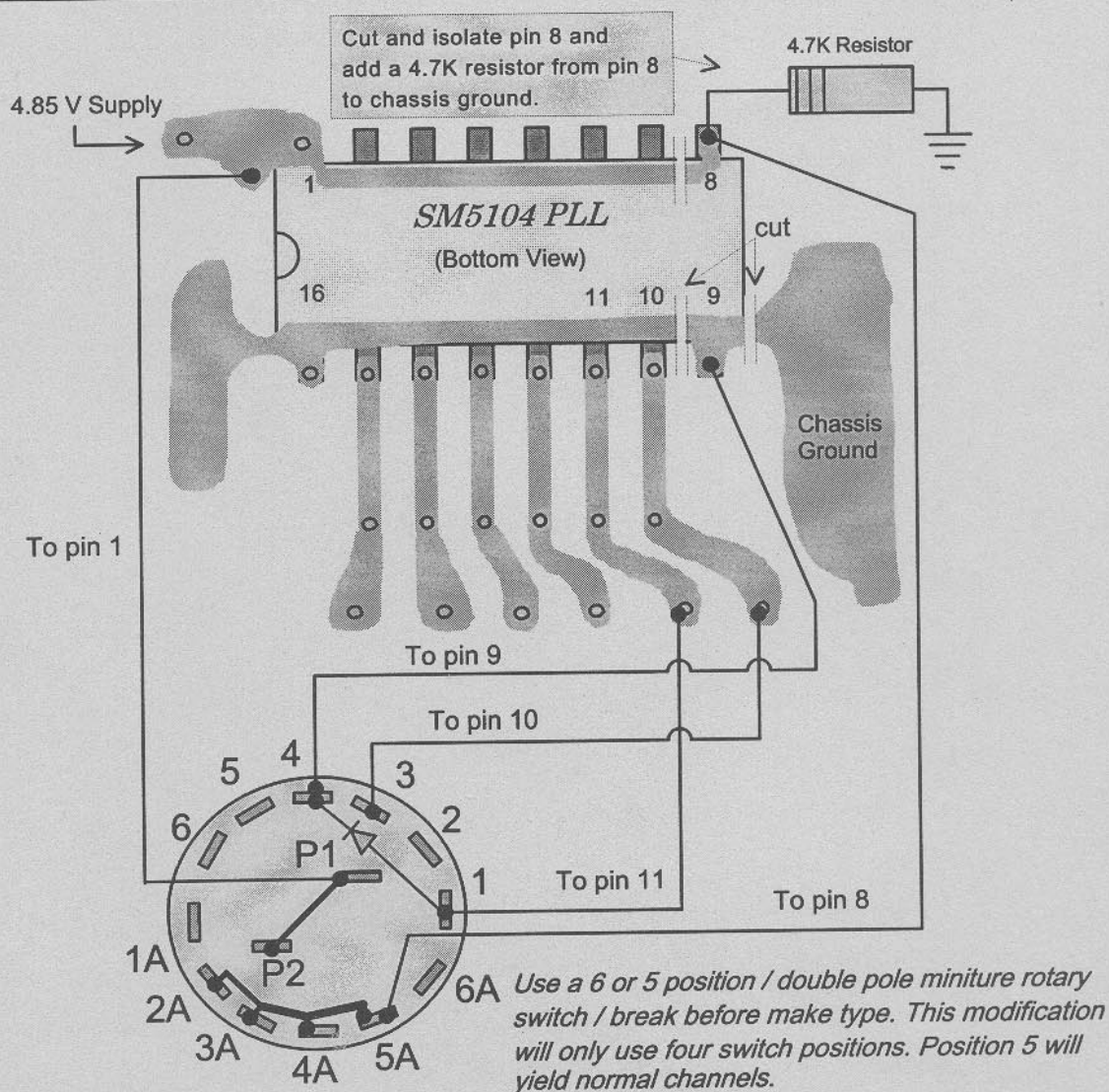
Clarifier Modification



Instructions

1. Locate and cut one end of R187, and D36. Locate the Red & Brown wires coming from the clarifier control.
2. Next trace the Red wire from the clarifier control to where it connects on the circuit board and cut it loose. Resolder the red wire to pin 3 of the MB3756 IC Regulator. You may need to add another piece of wire in order to reach pin 3. Now trace the Brown wire from the clarifier control to where it connects to the circuit board and cut it loose also. Next resolder the Brown wire to the circuit board ground. At this point the unit should slide about 4 KHz down and 1 KHz up.
3. Additional slide may be obtained by adding a 5.6 μ H choke in series with D37 as shown in the above diagram. The choke must be added between the varactor and ground in order to function properly. Once this choke has been added you will find that center slot is now at or near to the 3 o'clock position. You may also find that the stock clarifier is now somewhat unstable and covers the tuning range rather quickly. This could make the unit somewhat difficult to clarify. If this is the case we recommend that the stock clarifier be replaced with a new 20K ten-turn pot in order to remedy this problem.

SEARS 934.38270700 BASE/MOBILE CHANNEL CONVERSION



Once you have the radio apart you will need to unsolder the metal cover in order to expose the pins on PLL chip (SM5104). Next make all needed cuts and add the 4.7K resistor from pin 8 board ground. Be sure the wire leads do not short to any other pins or connections.

Next mount your rotary switch in any suitable location. Wire the switch as shown above.

Be sure to add the IN4148 or 1N914 signal diode from pin1 to pin 4 of the rotary switch. Cathode (banded end) connects to pin 4. Jumper pins 2A, 3A, 4A, & 5A together.

Some slight adjustment may of T302 (VCO) may be needed in order to cover all channels. T302 is located just behind the PLL chip. Be sure to use only a square plastic tool when adjusting this can. The coils break easily and it is very difficult to find replacements.

See the channel chart on the next page for your new channels.

Fig. 5104-CH

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SEARS 934.38270700 BASE/MOBILE

Channel Conversion Chart

POSITION #1 =

1 = 26.485	11 = 26.605	21 = 26.575	31 = 26.835
2 = 26.495	12 = 26.625	22 = 26.585	32 = 26.845
3 = 26.505	13 = 26.635	23 = 26.615	33 = 26.855
4 = 26.525	14 = 26.485	24 = 26.595	34 = 26.865
5 = 26.535	15 = 26.495	25 = 26.605	35 = 26.875
6 = 26.545	16 = 26.515	26 = 26.625	36 = 26.885
7 = 26.555	17 = 26.525	27 = 26.635	37 = 26.895
8 = 26.575	18 = 26.535	28 = 26.805	38 = 26.905
9 = 26.585	19 = 26.545	29 = 26.815	39 = 26.915
10 = 26.595	20 = 26.565	30 = 26.825	40 = 26.925

POSITION #2 = Normal 40 Channels

POSITION #3 =

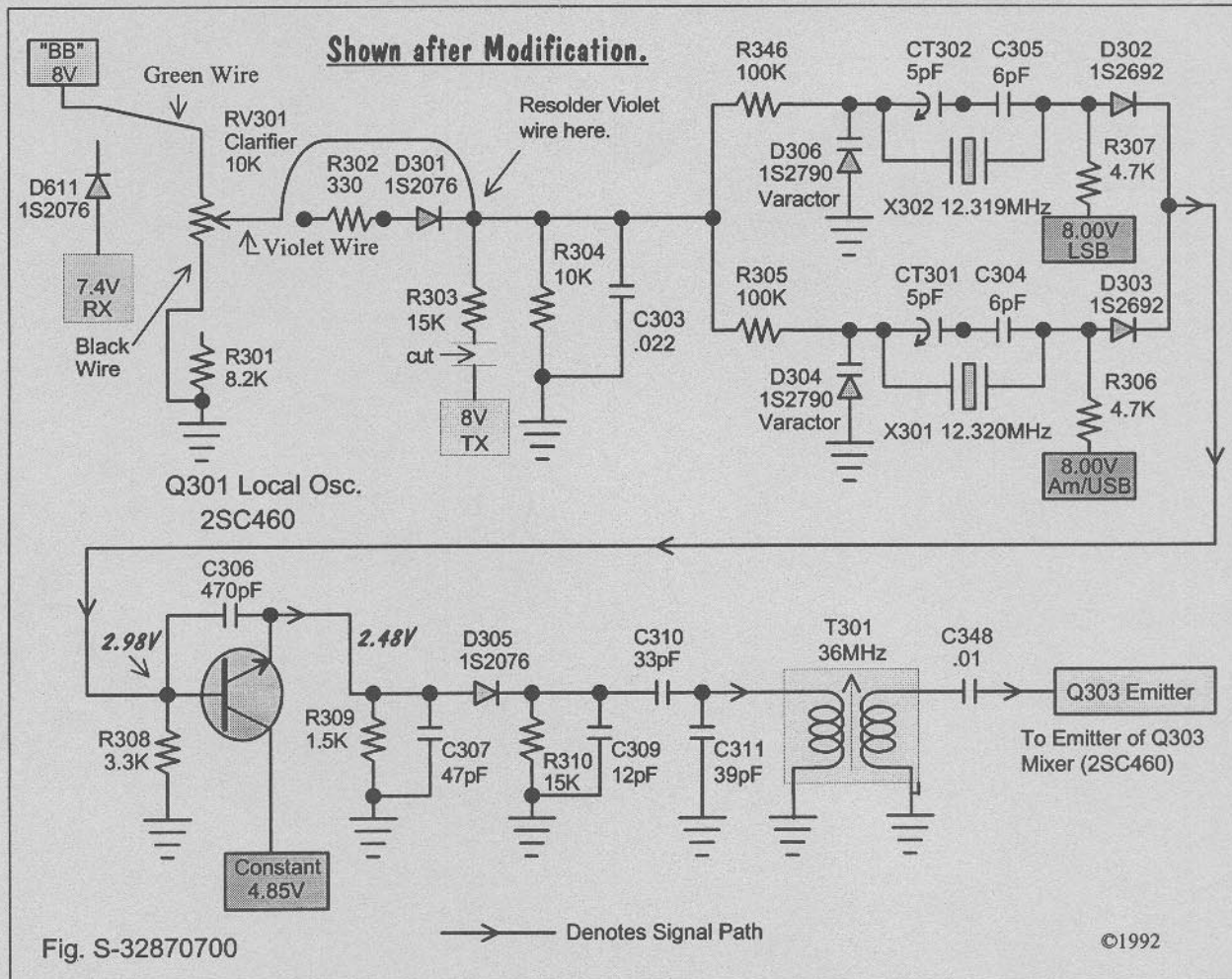
12 = 27.425	16 = 27.475	20 = 27.525	24 = 27.555
13 = 27.435	17 = 27.485	21 = 27.535	25 = 27.565
14 = 27.445	18 = 27.495	22 = 27.545	26 = 27.585
15 = 27.455	19 = 27.505	23 = 27.575	27 = 27.595

POSITION #4 =

1 = 27.605	11 = 27.725	21 = 27.855	31 = 27.955
2 = 27.615	12 = 27.745	22 = 27.865	32 = 27.965
3 = 27.625	13 = 27.755	23 = 27.895	33 = 27.975
4 = 27.645	14 = 27.765	24 = 27.875	34 = 27.985
5 = 27.655	15 = 27.775	25 = 27.885	35 = 27.995
6 = 27.665	16 = 27.795	26 = 27.905	36 = 28.005
7 = 27.675	17 = 27.805	27 = 27.915	37 = 28.015
8 = 27.695	18 = 27.815	28 = 27.925	38 = 28.025
9 = 27.705	19 = 27.825	29 = 27.935	39 = 28.035
10 = 27.715	20 = 27.845	30 = 27.945	40 = 28.045

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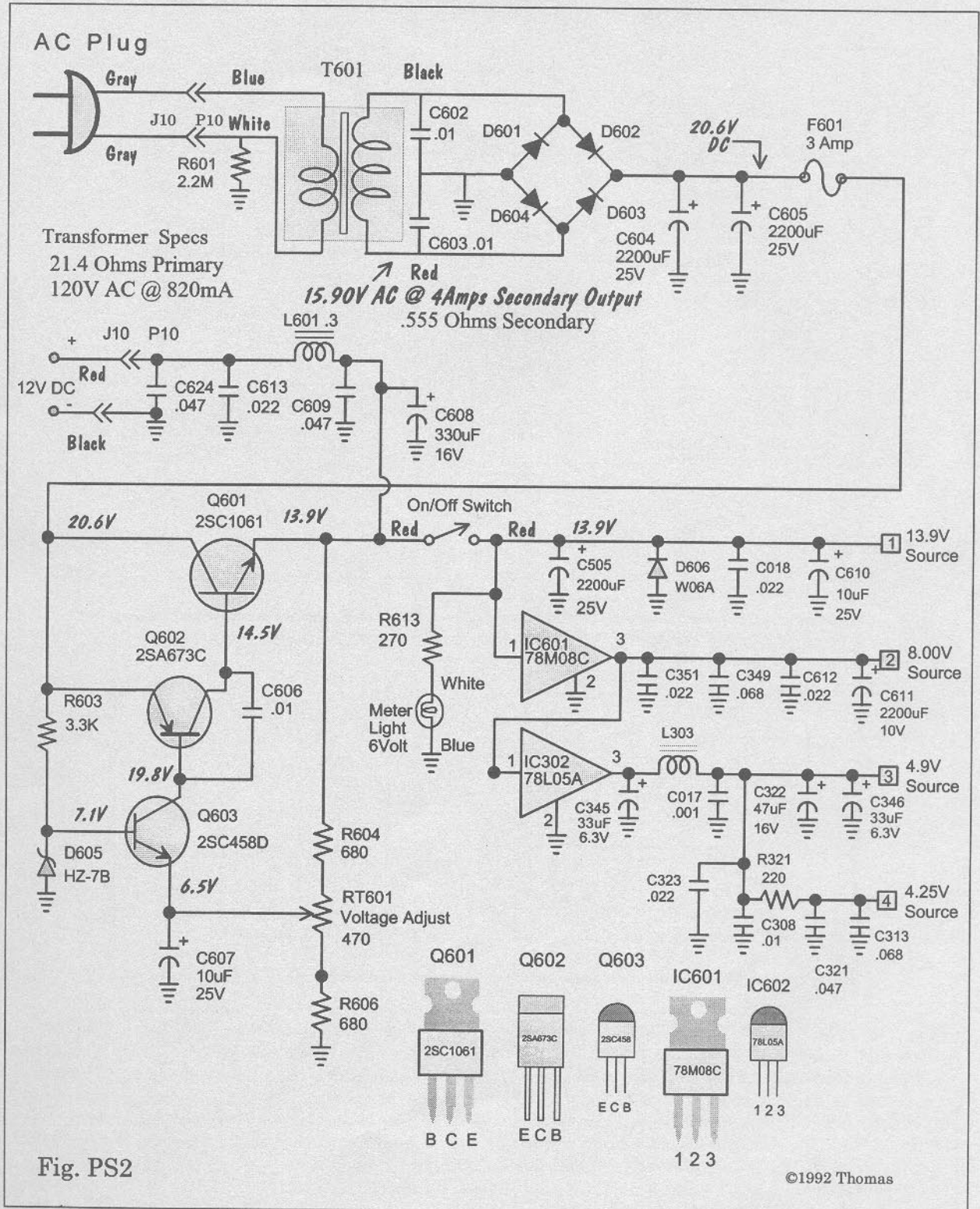
SEARS 934.38270700 BASE/MOBILE Clarifier & Oscillator Circuit Modification



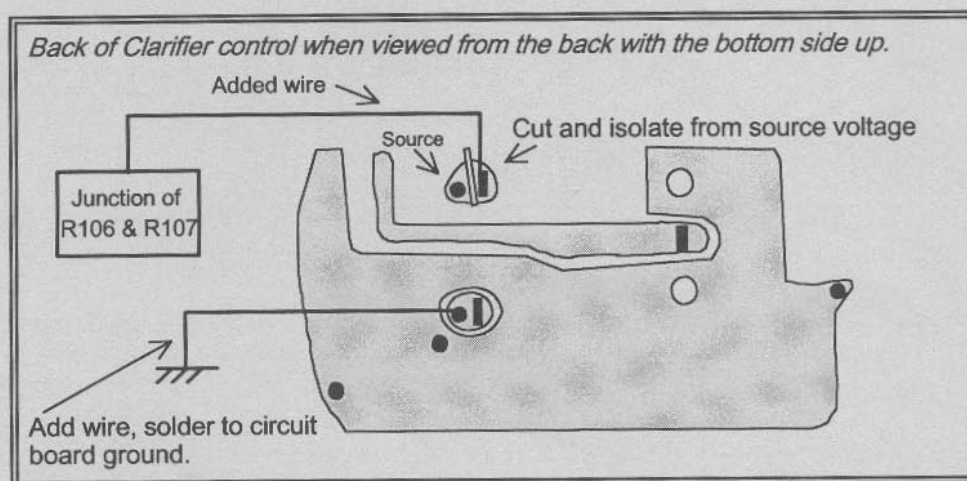
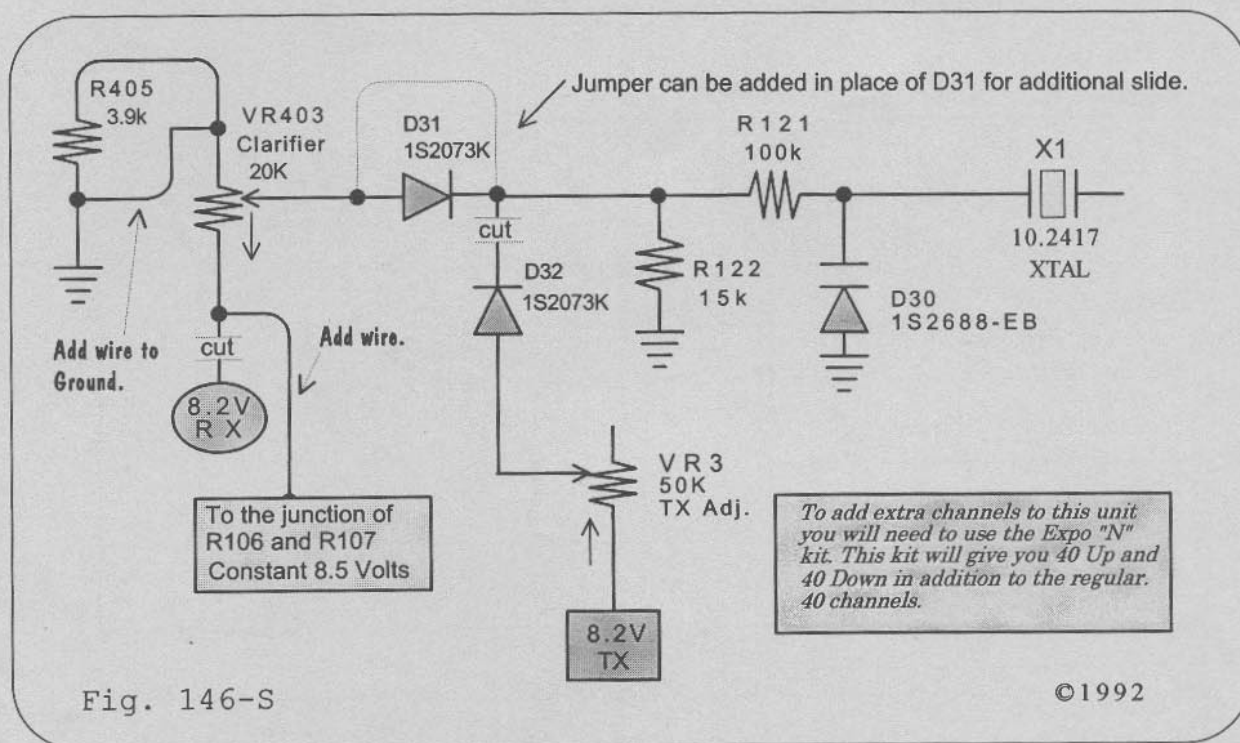
Clarifier Modification Instructions

1. Trace the green wire from the Fine Tuning control to where it is connected to the circuit board bottom, just behind the channel selector. Unsolder the green wire at this point and resolder it to point "BB", located just behind the meter display. There will already be a red wire soldered there. Next trace the Black wire from the Fine Tuning control to where it connects to the circuit board and unsolder it. Resolder the black wire to the circuit board ground. Next trace the violet wire from the Fine Tuning control and unsolder it. It will be soldered to the circuit board just behind the LED readout. Resolder the violet wire to the junction of R303 and the cathode (Banded end) of D301, located about an 1/8 of an inch from where you unsoldered the violet wire.
2. Next locate where the other end of R303 is soldered to a circuit board run that has a small rectangle with the letters "RD" inside of it. This is located just behind the LED readout. Carefully cut between these two points in order to remove R303 from the circuit.
3. The unit should now slide about 3KHz down and 3KHz up. On some units it may be necessary to resolder the violet wire back to its original location if the unit drops out of oscillation. If this is the case, then place a jumper across D301 for additional slide.

SEARS 934.38270700 BASE/MOBILE Power Supply Circuit

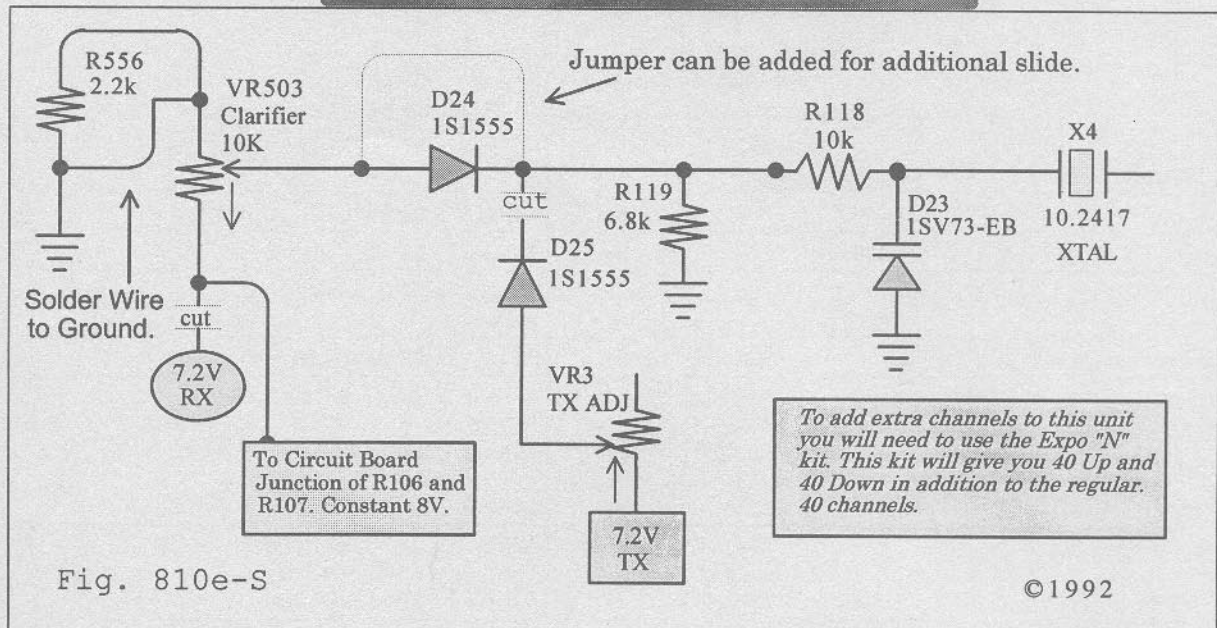


COBRA 146GTL & UNIDEN AR-144 Clarifier Slide Modification



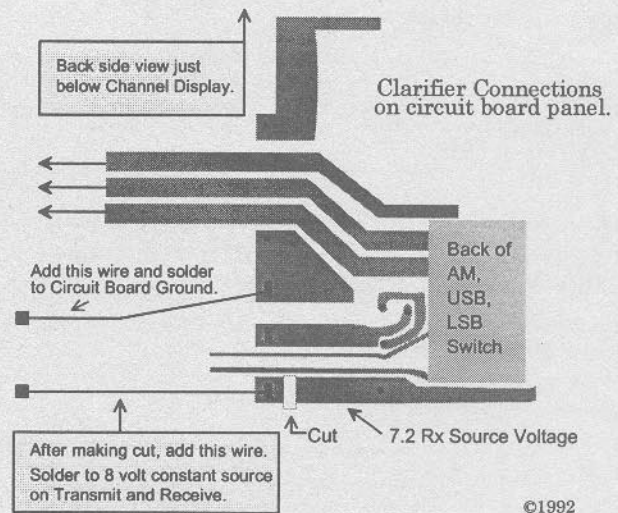
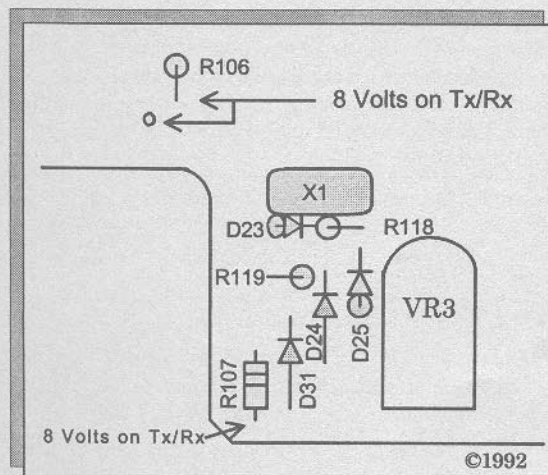
Note: The above clarifier modification is also basically the same for the Uniden AX-144 radio. The main difference is that R405 is R415 in the AX-144 and the clarifier control layout is different. Just remember that the center wiper of the clarifier control always goes to the clarifier circuit. One of the other two legs will either be at or near to ground potential - (usually below 2 volts) . This leg will need to be shorted to ground as shown. The other leg will be at source voltage potential - (usually aprox. 8.5 volts receive source). This leg with the source voltage will need to be isolated completely, then connected to a constant 8 volt source, in order to have slide capabilities on both transmit and receive . Solder this wire to the junction of R106 and R107 located just in front of L18 adjustment can.

UNIDEN PRO-810e Clarifier Slide Modification



Instructions

1. One of the first things you will need to do is to prepare the clarifier control. Locate the layout to the right and make the necessary cut. Make sure that you have totally isolated the contact before proceeding. Next add the two wires as shown. The one from the isolated contact solders to the junction of R106 and R107. This is a constant 8V source. The other wire is soldered to the circuit board ground.



2. Next locate D25 on the main circuit board and cut one end. Once this has been completed your unit will now track transmit and receive. Slide will normally range from 2 to 4 KHz. Also a jumper may be put in the place of D24 for an additional ½ to 1 KHz of slide potential.

UNIDEN PRO-810e ALIGNMENT PROCEDURE

PLL Synthesizer Alignment

Before proceeding be sure that the Channel 9 Switch is off and that the PA switch is off.

TEST EQUIPMENT TO USE & CONNECTION	RADIO SETTINGS			INSTRUCTIONS
	Channel	Mode	Clarifier Pos.	
Connect Oscilloscope to TP4	40	AM	Center	Adjust L38 for maximum reading
Connect DC voltmeter to TP2	40	AM	Center	Adjust L13 for 4.5 Volts $\pm$ 0.1 V
(Same as above)	1	AM	Center	Check if the VCO Voltage is above 2V. Adjust L13 if needed.
Connect Oscilloscope to TP3	1	AM	Center	Adjust L14 for maximum reading
Connect frequency counter to TP3	19	AM	Center	Adjust L15 for 16.490 Mhz $\pm$ 20Hz
	19	USB	Center	Adjust L16 for 16.4925 Mhz $\pm$ 20 Hz
	19	LSB	Center	Adjust L17 for 16.4875 Mhz $\pm$ 20 Hz
(Same as above)	19	LSB Transmit	Center	Adjust VR3 for 16.4875 MHz $\pm$ 20 Hz <i>Note : This adjustment will no longer be needed if the clarifier has been modified.</i>
Connect frequency counter to TP9	19	AM Transmit	Center	Adjust L18 for 10.695 MHz $\pm$ 20 Hz
Connect frequency counter to TP5	19	USB Receive	Center	Adjust L19 for 10.6925 MHz $\pm$ 20 Hz
(Same as above)	19	LSB Receive	Center	Adjust L20 for 10.6975 MHz $\pm$ 20 Hz

Receiver Alignment

Before proceeding set ANL/NB to off, PA to off, Volume to max, RF GAIN to max, squelch to min, HI CUT SWITCH to off

TEST EQUIPMENT TO USE & CONNECTION	RADIO SETTINGS			INSTRUCTIONS
	Channel	Mode	Clarifier Pos.	
Connect signal generator to Antenna output, 30dB level, 30% modulation, AF wattmeter connected across speaker terminals.	19	AM	Center	Adjust L3, L4, L6, L7, L8, L10, L11 for maximum output on AF wattmeter. Next adjust L5 for maximum output on AF wattmeter.
Connect signal generator to Antenna output, 30dB level, 30% modulation, AF wattmeter connected across speaker terminals.	1 and 40	AM	Center	Inject channel 1 signal and check AF wattmeter reading. Then inject a channel 40 signal and again check AF wattmeter reading. If these two readings are not within 1dB adjust L5 until the levels on channel 1 and 40 are within 1dB
Connect signal generator to Antenna output, 20dB level, 30% modulation, connect oscilloscope to TP1 (R15 lead)	20	USB	Center	Adjust L2 for maximum reading on oscilloscope Set ANL/NB switch to on pos.
Connect signal generator to Antenna output, 66dB level, 30% modulation.	19	AM	Center	Adjust VR2 until squelch just breaks. Turn squelch control to fully clockwise position.
Connect signal generator to Antenna output, 46dB level, no modulation.	19	AM	Center	Adjust VR1 until the "9" just lights on the LCD display.

UNIDEN PRO-810e

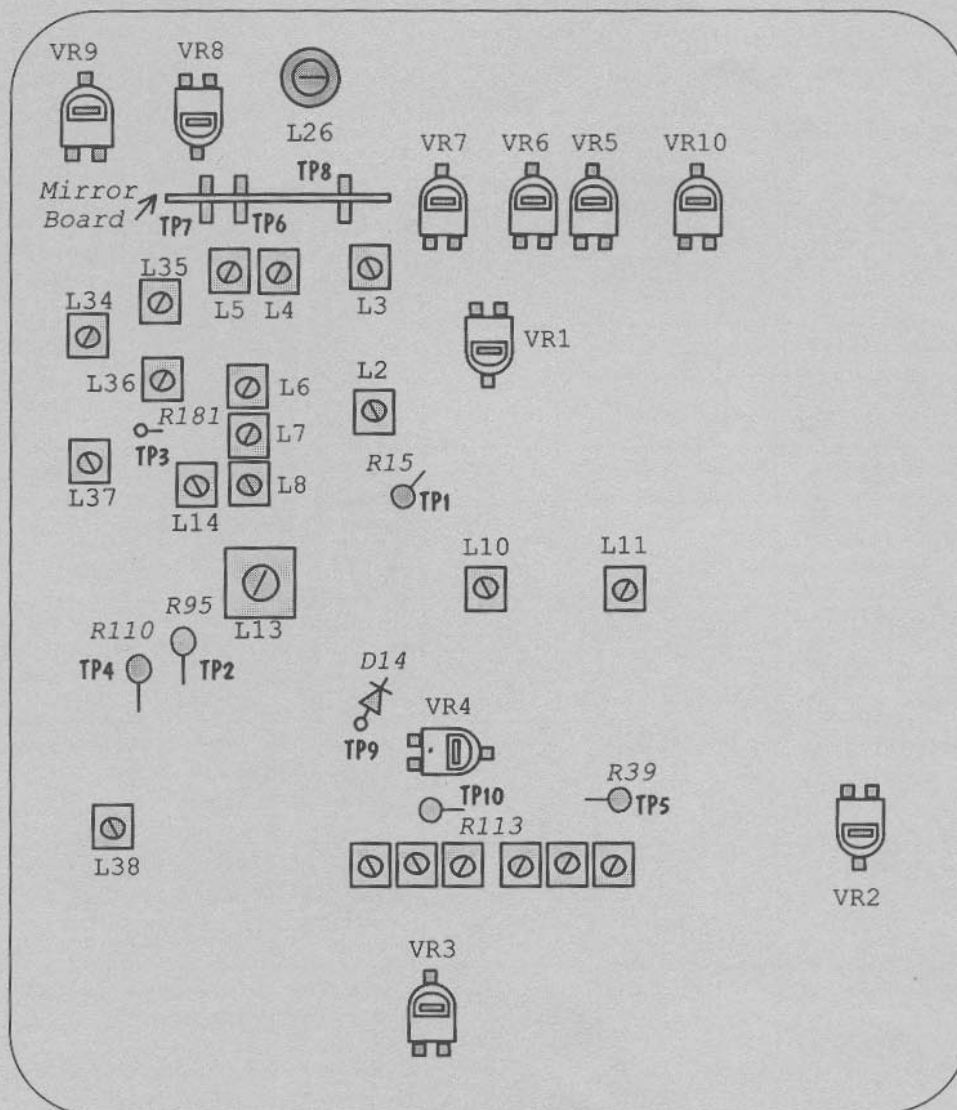
Transmitter Alignment Procedure

Before proceeding set CB/PA switch to CB, MIKE GAIN control to max

TEST EQUIPMENT TO USE & CONNECTION	RADIO SETTINGS			INSTRUCTIONS
	Channel	Mode	Clarifier Pos.	
Remove the PB-100 mirror board from TP6, TP7, and TP8. Connect a DC amp meter to TP8 (+) and to TP7 (-)	19	USB		Key radio with no modulation and adjust VR9 for a 65 mA $\pm$ 2 mA reading on DC amp meter.
Connect a DC amp meter to TP8 (+) and to TP6 (-)	19	USB		Key radio with no modulation and adjust VR8 for a 70 mA $\pm$ 2 mA reading on DC amp meter. Reinstall PB-100 mirror board after making this adjustment..
Connect a RF power meter to the antenna jack	19	USB		Key radio and inject a 2-tone 20mV audio signal at the mike input. Adjust L34, L35, L36, L37, L14 for maximum reading on the RF power meter. Repeat.
(Same as above)	1 and 40	USB		Key radio and inject a 2-tone 20mV audio signal at the mike input. Check power level on channel 1 and channel 40. If necessary adjust L36 for minimum variation between them.
(Same as above)	19	USB		Key radio and inject a 2-tone 20mV audio signal at the mike input. Adjust VR6 for maximum reading on the RF power meter.
(Same as above)	19	USB		Key radio and inject a 2-tone 30mV audio signal at the mike input. Adjust VR4 for minimum carrier leakage between USB and LSB.
(Same as above)	19	AM		Key radio and inject a 400Hz audio signal at the mike input. Adjust L26 for maximum reading on the RF power meter.
(Same as above)	19	AM		Key radio with no modulation and adjust VR10 for desired AM power output level. <i>Do not turn VR10 full open. This will help prevent damage to Q503, Am regulator.</i>
(Same as above)	19	AM		Key radio with no modulation and adjust VR7 for the "4" reading on the RF POWER on the unit. <i>Although this will not match the actual RF output, by performing this adjustment as described will help to prevent damage to the LCD driver when unit is transmitting more than 4 watts output.</i>
Connect a Modulation meter to the antenna jack.	19	AM		Key radio and inject a 400Hz audio signal at the mike input. Adjust VR5 for desired modulation level.

UNIDEN PRO-810e

Alignment Layout



Variable Adjustments

VR1 = Receive Meter
 VR2 = Squelch Range Adjust
 VR3 = Transmit Frequency Adjust
 VR4 = Carrier Balance

VR5 = Modulation AMC
 VR6 = SSB Power ALC
 VR7 = Transmit Meter

VR8 = Final Bias Adjust
 VR9 = Driver Bias Adjust
 VR10 = AM Transmit Power

VR3 will no longer be needed if the unit has had the clarifier modified.

NOTE: A complete Flow Chart, Voltage Chart, and IC / Transistor pinout for the PRO-810e will be included in CB MASTER EDITION Volume 5.

UNIDEN PRO-810e AC POWER SUPPLY SCHEMATIC

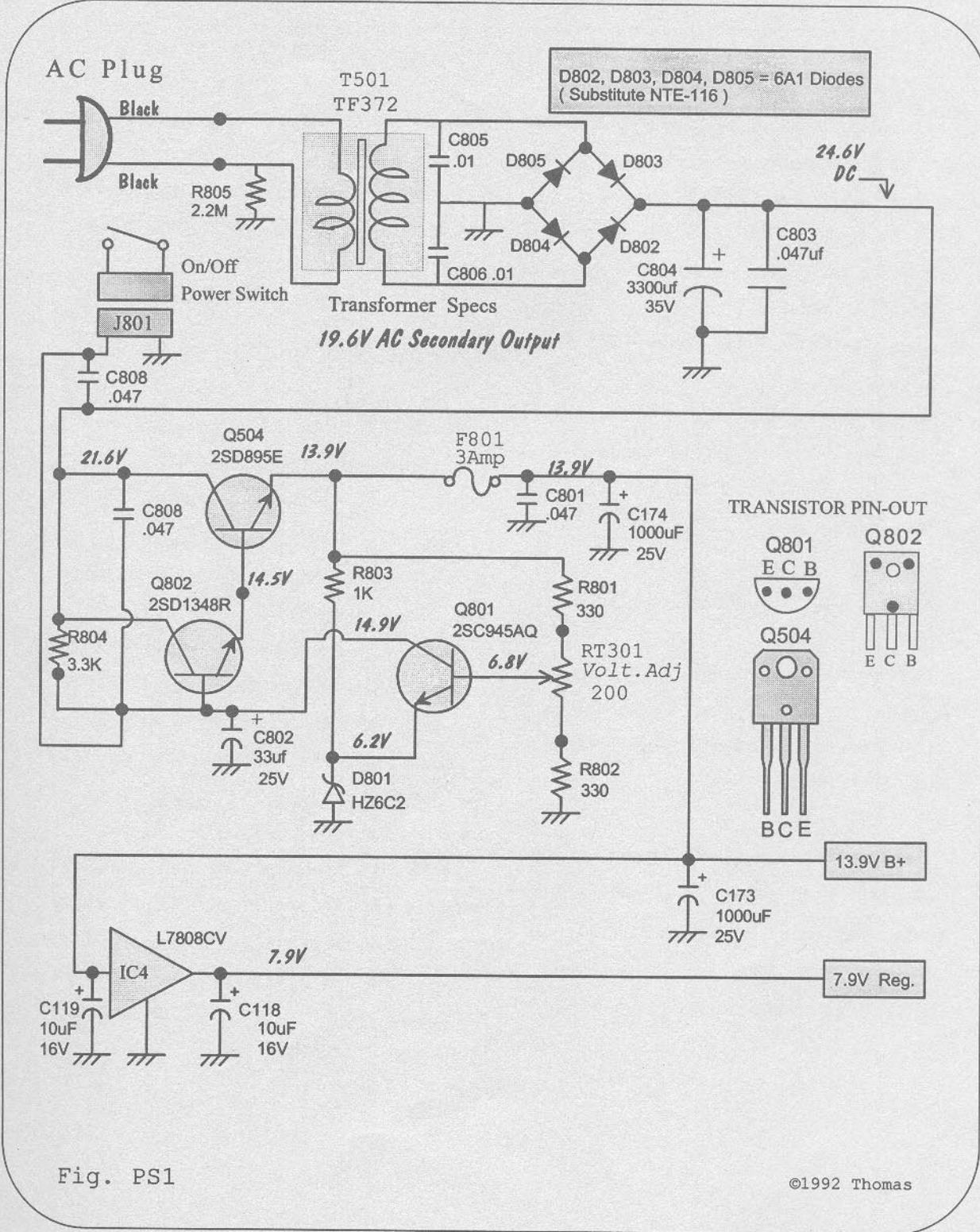


Fig. PS1

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GALAXY SATURN

PLL Circuit Theory

PLL CIRCUITRY

PLL is an abbreviation of the phase-locked loop, which is fundamentally composed of a closed loop feedback circuit. The feedback component is the balance of frequency drifts and the PLL circuit acts to cancel it out. To detect out the frequency drifts of the PLL output, a fixed reference oscillator (10kHz, 1/1024 divided down from 10.240 Mhz) is compared constantly with the input frequency (10kHz). The input frequency is obtained by dividing the VCO frequency. A functional block diagram is provided below under 'PLL CIRCUIT' for easier understanding.

OFF-SET FREQUENCY OSCILLATOR TR-29

The off-set frequency oscillator TR-29 oscillates at 14.460 Mhz for all band s. Switching between these oscillating frequencies is made by biasing the diodes D97 to D111.

The off-set frequency signal is obtained at TR-29 emitter and flows through L-16 and C-88 into TR-25 mixer where it is beat with the VCO signal.

The VCO signal is obtained from the following.

$$f_{vco} = f_{off-set} + N_{fr}$$

Where, f_{vco} = VCO frequency, N = programming code for the divider output, fr = reference frequency step, 0.01 MHz. i.e. At channel #1 in band A, and AM band, the corresponding N code is 91.

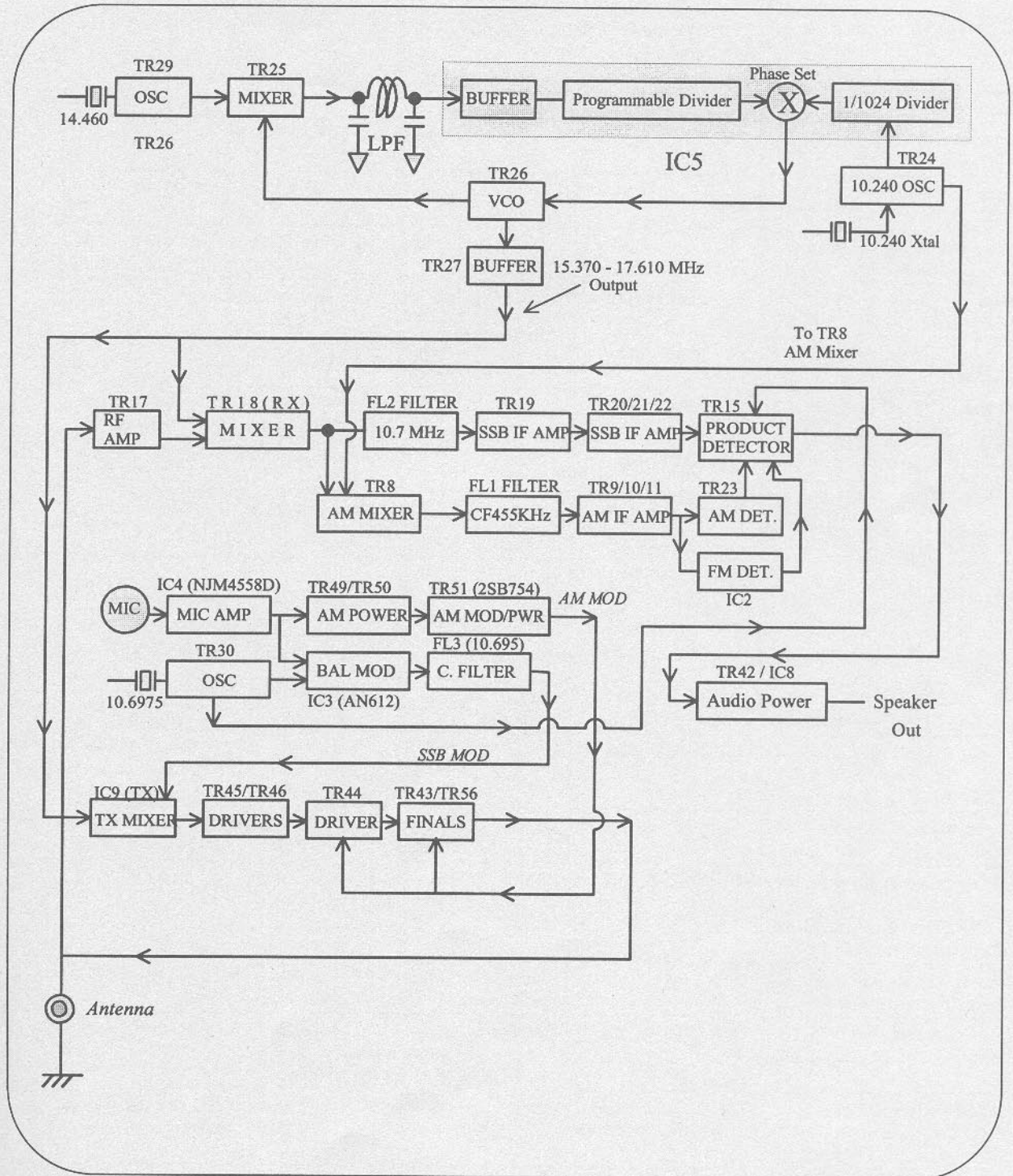
$$f_{vco} = 14.460 + 91 \times 0.01 = 15.370 \text{ MHz}$$

Since the mixer output is determined by two factors, the off-set frequency output (dependant on the band selector switch position) and the VCO output, the mixer output contains the subtracted frequencies of 0.91 to 3.15 MHz. These frequencies appear on pin #2 of IC-5 through C-82, and divided by the programmable divider in IC-5 down to 10 KHz which is compared with another 10 KHz signal obtained from the reference oscillator (10.240).

The VCO output is mixed with the off-set frequency signal and applied to the TX mixer IC-9 through band-pass filters L-43 and L-44. i.e. At channel 1 in Band A, and set to AM Band, the TX mixer accepts $15.370 + 10.695 \text{ MHz}$ (From TR-30, Oscillator) = 26.065 which is the TX frequency.

GALAXY SATURN

Block Diagram/Flo-Chart



GALAXY SATURN

Alignment Procedure

Synthesizer Alignment

TEST EQUIPMENT TO USE & CONNECTION	RADIO SETTINGS			INSTRUCTIONS
	Channel	Mode	Clarifier Pos.	
Input of frequency counter to the junction of C78 and C79				Check for 10.2400 $\pm$ 20Hz
Input of frequency counter to TP6 (Anode of D27)		CW		Adjust L26 for 10.6950 MHz $\pm$ 0, -100Hz
Input of Frequency counter to TP6 (Anode of D27)		USB		Adjust L27 for 10.6925 MHz $\pm$ 0, -100Hz
Input of frequency counter to TP6 (Anode of D27)		LSB		Adjust L28 For 10.6975 MHz $\pm$ 0, -100Hz
Input of Oscilloscope to TP4 (Junction of C82,R107 & L46)	19 C Band	AM		Adjust L16 for maximum RF output
Input of Oscilloscope to TP3 (Jumper J58)	40 E Band	AM		Adjust L18 for maximum RF output.
Connect DC volt meter to TP2 (Junction of R109 and C81)	40 E Band	AM		Adjust L17 for 5.0 V $\pm$ 0.1V Check Ch17 A Band, must be 1.5V minimum
Connect Frequency counter to TP3 (Jumper J58)	19 C Band	AM	Center	Adjust L19 for 16.490 MHz $\pm$ 50Hz
(Same as Above)	19 C Band	USB	Center	Adjust L20 for 16.4925 MHz $\pm$ 50Hz
(Same as Above)	19 C Band	LSB	Center	Adjust L21 for 16.4875 MHz $\pm$ 50Hz

Receiver Alignment

Connect a AC Volt Meter or Metered Dummy Load across the speaker terminals for measurement.

TEST EQUIPMENT TO USE & CONNECTION	RADIO SETTINGS			INSTRUCTIONS
	Channel	Mode	Clarifier Pos.	
Connect signal generator to Ant input. Set to 27.185, 30% Mod, output 50 μ V.	19 C Band	AM	Center	Adjust L3, L4, L6, L7, L8, L10, L11, L12 for maximum indication on AC Volt Meter or Dummy Load.
Set signal generator to 26.186, No Modulation, output 50 μ V	19 C Band	USB	Center	Adjust L13, L14 for maximum indication on Ac Volt Meter or Dummy Load.
Set signal generator to 27.185, and apply a 1 μ V, FM signal with 1.5KHz Deviation with 1Khz audio to Ant. Input	19 C Band	FM	Center	Readjust L5 for maximum indication on AC Volt Meter or Dummy Load.
Set signal generator to 27.185, 30% modulation, 1000 μ V.	19 C Band	AM	Center	Adjust VR4 so that the squelch just breaks. Readjust VR4 until squelch just quiets unit.
Set signal generator to 27.185, 30% Modulation, Output 100 μ V	19 C Band	AM	Center	Adjust VR1 so that the S-meter reads '9'. Then set mode selector to USB and adjust VR2 so that the S-meter again reads '9'.
Noise Blanker Adjustment Set signal generator to 27.185, No Modulation, Output 100 μ V	19 C Band	AM NB/ANL Switch on	Center	Connect a DC volt meter to TP1 and adjust L1 and L2 to obtain a 2.5 volt $\pm$ 0.5v reading.

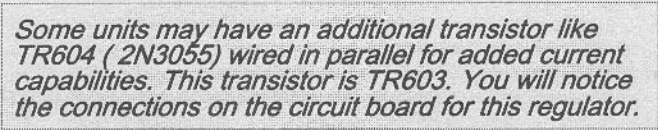
GALAXY SATURN

Transmitter Alignment Procedure

TEST EQUIPMENT TO USE & CONNECTION	RADIO SETTINGS			INSTRUCTIONS
	Channel	Mode	Clarifier Pos.	
Connect DC mA meter to TP9 (+) and TP8 (-)	19 C Band	USB		Key radio with no modulation and adjust VR11 for 20 mA ± 0.5 mA.
Connect DC mA meter to TP9 (+) and TP7 (-)	19 C Band	USB		First adjust VR10 and VR20 to their minimum position (fully counter clockwise). Key radio with no modulation and adjust VR10 to 50 mA ± 5 mA and then adjust VR20 to 100mA ± 5 mA
RF Wattmeter to Antenna Connector, Key radio and Inject a 1000Hz 30mV to mike audio input (Pin 2)	40 E Band	USB		Adjust VR12 and L42 for maximum RF output. Next adjust L40, L43, L44 and L33 fro maximum RF output . Repeat these adjustments again. Next adjust L42 for equal power output on CH40 E Band and CH1 A Band.
RF Wattmeter to Antenna Connector Key radio and Inject a 2-tone (500Hz and 2400 Hz 30mV) audio signal to mike audio input (Pin 2)	40 E Band	USB		Adjust VR12 for maximum output. <i>Be sure that you do not adjust VR12 past the 2:00 position. Doing so can cause damage to the RF outputs and / or cause severe distortion on transmit.</i>
RF Wattmeter to Antenna Connector, RF power full, Key radio	19 C Band	AM		Adjust VR13 for desired HI power AM/FM output power
RF Wattmeter to Antenna Connector, RF power set to Low (fully counter clockwise), Key radio	19 C Band	AM		Adjust VR803 for desired Low power setting on AM/FM. <i>VR803 is located on switch function selector board.</i>
RF Wattmeter to Antenna Connector, ter clockwise , Key radio	19 C Band	AM		Adjust VR8 so that the internal RF power meter reads the same as the external RF meter
Modulation Meter to Antenna Connector, Key radio and Inject a 400Hz 30mV audio signal to mike audio input (Pin 2)	19 C Band	AM		Adjust VR14 for desired AM Modulation
Connect a deviation meter or a linear detector meter to antenna connector. Key radio and inject a 1000Hz 30mV audio signal to the mike audio input. (Pin 2)		FM		Adjust VR5 for 2 to 3 KHz of FM deviation
Connect a 8 Ohm dummy load and a AC Voltmeter to the external Speaker jack, and connect a key switch to the key switch jack. Key Switch to on.		CW		Adjust VR16 for a 200mv ± 10 mV reading on the AC voltmeter for CW Tone level.

GALAXY SATURN

Power Supply

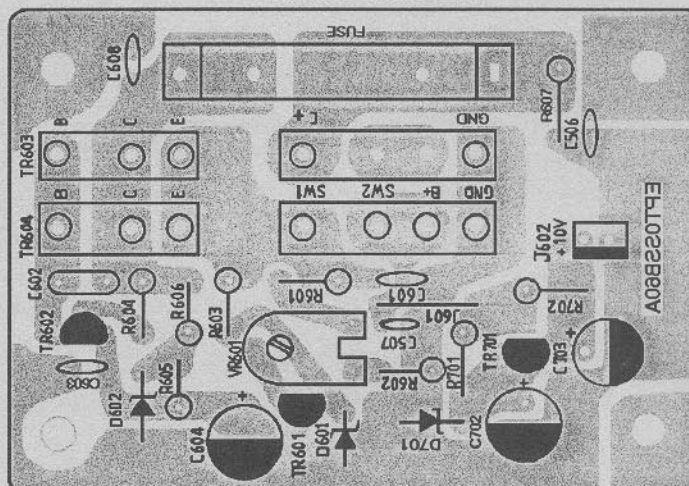


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GALAXY SATURN

Power Supply Board Layout

GALAXY SATURN



EPT055B60A POWER SUPPLY

Part Description	Original Number	NTE Replacement	RCA Replacement
D601 5.6V Zener 1 Watt	ZD5.6A	NTE-136A	SK5V6/136A
D602 16.2V Zener 1 Watt	ZD16.2A	NTE-5075A	SK16V/5075A
D701 11V Zener 1 Watt	ZD11V	NTE-5074A	SK11V/5074A
D603,D604,D605,D606 Bridge Rectifier	KBPC1004	NTE-5314 - 8 Amp 400PIV	SK-3987
TR604 Regulator	2N3055	NTE-130	SK-3027
TR602 Regulator	2SC1571G	NTE-199	SK-3245
TR601 Error Amp	2SD471P	NTE-293	SK-3849
TR701 Regulator	2SC1318	NTE-289A	SK-3124A

CAPACITORS	
C195	1000 μ F 25V
C506	.01 μ F 50WV
C507	.01 μ F 50WV
C601	.01 μ F 50WV
C602	.022 μ F 100WV
C603	.047 μ F 50WV
C604	100 μ F 25V
C605	10,000 μ F 35V
C606,C607	.022 μ F 100WV
C608	.022 μ F 100WV
C702	100 μ F 16V
C703	100 μ F 16V

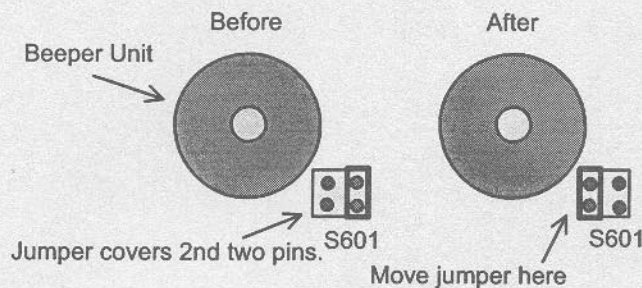
RESISTORS	
R501	1 K 1/2 Watt
R601	1.2 K 1 Watt
R602	820 Ohm 1 Watt
R603	820 Ohm 1 Watt
R604	47 Ohm 1 Watt
R605	100 Ohm 1 Watt
R606	220 Ohm 1 Watt
R607	10 K 1 Watt
R701	1 K 1/2 Watt
R702	47 Ohm 1 Watt
VR601	500 Ohm 1/2 Watt
R901	2.2Meg 1/2 Watt

NOTE

Volume 5 will include the complete Schematics of the Galaxy Saturn frequency counter module and the Echo Board, complete with voltage charts. These will not be in the normal hard to read print. *We will not use any original schematics in our manuals that are already totally impossible to read.* We will totally redraw them for your use.

Thomas Publishing

RCI-2950 Frequency Conversion



With the bottom cover off tilt the unit up and toward you. Locate the beeper unit mounted to the board directly behind the front panel. Locate just to the left front of the beeper unit S601. Notice that there is a jumper across the 2nd two pins of S601. Carefully remove this jumper and replace it across the first set of pins of S601.

The unit will now have full channel coverage.

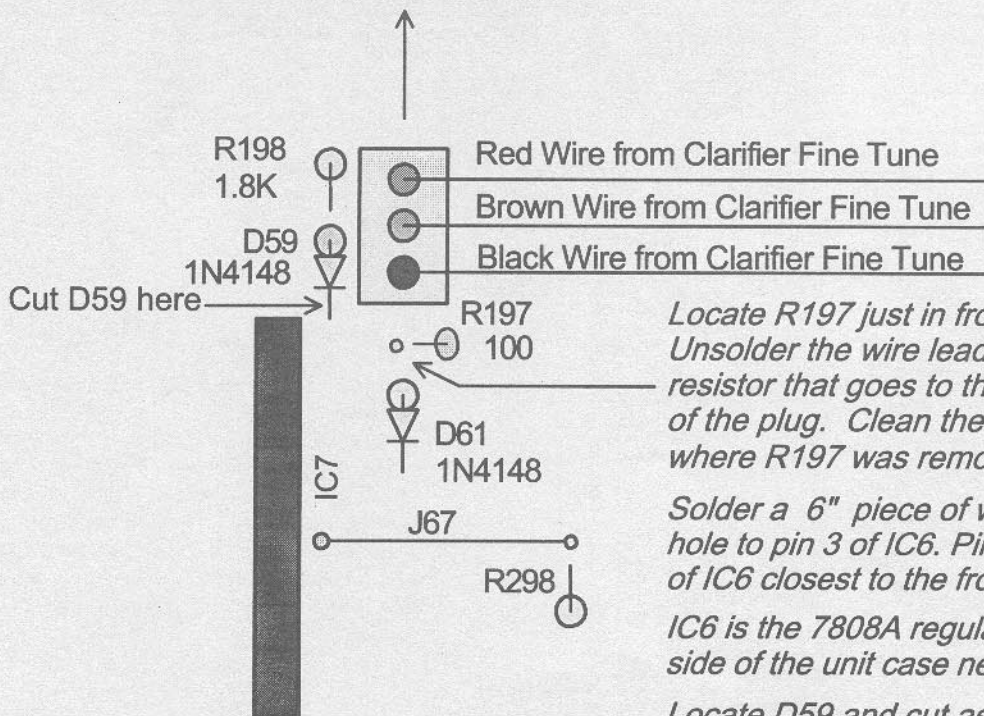
Fig.2950-C

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RCI-2950 Clarifier Modification

Located on the main circuit board.

To the back of unit



Locate R197 just in front of the plug. Unsolder the wire lead side of this resistor that goes to the black wire of the plug. Clean the hole from where R197 was removed.

Solder a 6" piece of wire from this hole to pin 3 of IC6. Pin 3 is the leg of IC6 closest to the front of the radio. IC6 is the 7808A regulator on the side of the unit case near the front.

Locate D59 and cut as shown.

The unit will now track Tx and Rx with the fine tune.

Fig. 2950-S

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RCI-2950 Improvement Modifications

Problem: Noisy receiver. Unit has a high level of vehicle noise (i.e., Fan noise, Electronic Fuel Pump noise, etc..)

Cure: To reduce front end overloading on the RCI-2950 (i.e., quiet the receiver) change R78 from a 2.2K resistor to a 10K resistor. This modification will reduce the bias on the first RF Amplifier, Q18, thus aiding in reducing impulse noise created by the various electronic or electric components in the installed vehicle. In some of the more difficult cases, a .047 uf electrolytic capacitor may need to be installed across the power terminals of electronic fuel pump or fan motor. Additional filtering may be also required across the radio's DC input. Any good commercial filter rated at least 15 Amps or higher can be used.

Problem: Stations close by sound distorted or garbled. However distant stations sound O.K.. Automatic Gain Control does not seem to be functioning properly.

Cure: To reduce the effects of A.G.C. overload on receive, change R49 from a 100K resistor to a 33K resistor. Normally this will cure the problem in most units. In some units it will also be necessary to change R78 from a 2.2K resistor to a 10K resistor in order control front end overloading of the receiver.

Problem: Unit fails to operate on initial turn on. Turning the radio off then back on causes the radio to operate.

Cure: This problem is usually caused by the V.C.O. being out of lock. In order to prevent future occurrences, it will be necessary to change C107 to a 100pf NPO disk capacitor. Once this capacitor has been replaced you will need to readjust the V.C.O. voltage. Locate J13 and connect a DC volt meter between it and ground. Set the radio to 28.0 MHz and then adjust L17 for a 1.9 volt reading on the DC volt meter.

RCI-2950

Improvement Modifications

Problem: The Variable Frequency Adjust located above the microphone jack does not operate properly. Several clicks are required before the frequency changes.

Cure: A resistor change will be required in order to cure this problem. Locate and change R611 on the microprocessor board from a 47K Ohm chip resistor to a 10K Ohm chip resistor. If a 10K Ohm chip resistor is not available a standard 1/8th watt 10K resistor can be used.

Problem: Premature battery failure.

Cure: The lithium memory battery which is installed on the microprocessor should have a normal lifetime of 2 to 3 years under normal use. One cause for premature failure of this battery is the excessive use of the reset switch (S601). This switch can be used to disrupt the normal power up and power down initialization process that the microprocessor executes. One alternative is to advise the customer of this problem and to avoid excessive use of the reset switch. The best solution is to remove S601.

Battery Replacement Procedure for RCI-2950

Remove the defective battery , and replace. After the new battery has been installed it will be necessary to re-initialize the microprocessor for proper operation. To do this turn the unit on and then back off again. Once this has been done turn the unit back on and check for proper operation. If all functions seem to be operating then turn the unit off and allow it to set for about 5 minutes or so. After the unit has set for this period of time, check the voltage of the new battery in order to make sure there are no shorts which are causing the battery to fail. If the voltage begins to drop , the microprocessor may be defective and will need to be replaced.

VARIABLE ALIGNMENT ADJUSTMENTS

COBRA RADIOS

19GTL

VR3 = Squelch Adj.
VR4 = Receive Meter

VR5 = Transmit Meter

VR6 = Modulation AMC

25PLUS

VR1 = Receive LED Level

VR2 = Squelch Adjust

VR3 = Transmit Led Level

Receive Adjust = L2,L3,L4,L5,L6,L7
Transmit Adjust = L18,L17,L16,L15

40X

RV101 = Squelch Adjust
RV102 = Receive Meter

RV201 = Modulation AMC (Or remove C215)
RV202 = Transmit Meter

Receive Adjust = L101,L102,L103,L104,L105,L106,L108
Transmit Adjust = L301,L302,L303,L304,L305,L306

COLT RADIOS

357

RV1 = Receive LED Level

RV2 = Squelch Adjust

RV3 = Modulation AMC

Receive Adjust = HT101,HT102,HT103,HT104,HT105
Transmit Adjust = LX18,LX19,LX20

CRAIG RADIOS

L231

R106 = Transmit Meter
R130 = SSB Power ALC
R229 = Am Receive Meter
R240 = SSB Receive Meter

R309 = Receive AGC
R315 = Squelch Adjust
R401 = Carrier Balance #1
R414 = Carrier Balance #2

R605 = Modulation AMC
R711 = Channel Display

Receive Adjust = T201,T202,T203,T204,T205,T206,T301,T302,T303
Transmit Adjust = T103,T102,T101,L111,L109,L106

FORMAC RADIOS

FORMAC 88

RV1 = Squelch Adjust
RV2 = Modulation AMC

RV4 = Transmit Meter
RV3 = Receive Meter

RV501 = Fm Deviation
CT1¹ = 10.240 Adj.
CT1² = 20.705 Adj.

1. Located on Main Board
2. Located on Oscillator Board

FORMAC 240 (Unit Has two VR3's)

VR1 = Transmit Meter
VR3¹ = Fm Deviation
VR3 = Low Power Modulation

VR4 = Mid Power Modulation
VR5 = Hi Power Modulation
VR6 = Mid Power Level

VR7 = Low Power Level
VR8 = Squelch Adjust
VR9 = Receive Meter

1. VR3 located next to R145

FULCOMM RADIOS

2330

VR151 = Receive Meter
VR152 = Recieve RF Gain

VR181 = Squelch Adjust
VR481 = Modulation AMC

VR491 = Transmit Meter

Receive Adjust = L111,L112,L121,L122,L131,L141,L151
Transmit Adjust = L431,L432,L433,L441,L451,L463,L464

GEMTRONICS RADIOS

GTX-3323

VR151 = Receive Meter
VR152 = Recieve RF Gain

VR181 = Squelch Adjust
VR481 = Modulation Amc

VR491 = Transmit Meter

Receive Adjust = L111,L112,L121,L122,L131,L141,L151
Transmit Adjust = L431,L432,L433,L441,L451,L463,L464

G.E. RADIOS

3-5806

RV1 = Receive L.E.D. Meter
RV2 = Transmit L.E.D. Meter

VR3 = Squelch Adjust

VR4 = Modulation AMC

Receive Adjust = L1,L2,L3,L4,L5
Transmit Adjust = L6,L7,L8,L9,L11,L12

3-5813

RV1 = Squelch Adjust
RV2 = Modulation AMC

RV3 = Receive Meter
RV4 = Transmit Meter

RV501 = Ant. Warning AWI

3-5816A

RV1 = Transmit Meter
RV2 = Receive Meter

RV3 = Squelch Adjust

RV4 = Modulation AMC

3-5826A

RV2 = SSB Power ALC
RV3 = Receive Meter

RV4 = Transmit Meter
RV6 = Modulation AMC

RV7 = AM Power

JC PENNY RADIOS

981-6221

RT1 = Receive Meter
RT2 = Transmit Meter

RT101 = Receive RF Mixer Gain

RT102 = Squelch Adjust

Receive Adjust = T101,T102,T201,T202
Transmit Adjust = T701,T702,T703,T704,T705 (Modulation Cut D502)

KRACO RADIOS

KCB-1401

VR2 = Transmit Meter
VR3 = Receive Meter

VR5 = Squelch Adjust
VR7 = Modulation AMC

VR8 = Receive RF Gain

Transmit Adjust = L11,L10,L9

LAKE RADIOS

600

VR1 = Squelch Adjust
VR2 = Modulation AMC

VR3 = Receive Meter
VR4 = Transmit Meter

PT25 = 10.240 Xtal Adjust

Receive Adjust = RX7,RX6,RX5,RX4,RX3,RX2,RX1

Transmit Adjust = PLL5,PLL6,TX1,LC202,LC203,LC204

MIDLAND RADIOS

77-101C

RV101 = Squelch Adj.
RV103 = Receive Meter

RV201 = Modulation AMC

RV202 = Transmit Meter

77-102 (102M)

RV101 = Squelch Adj.
RV102 = Receive Meter

RV201 = Modulation AMC

RV202 = Transmit Meter

77-104

RV1 = Recive LED
RV2 = Transmit LED

RV3 = Squelch Adjust
RV4 = Modulation AMC

CT1 = 10.240 Xtal Adjust

77-808

RV1 = Squelch Adjust
RV2 = Modulation AMC

RV3 = Receive Meter

RV4 = Transmit Meter

Transmit Adjust = L9,L8,L4

77-824B

VR1 = Rx IF Gain
VR2 = Squelch Adjust

VR3 = Receive Meter
VR4 = Transmit Meter

VR5 = Modulation AMC

77-824C

RV101 = Squelch Adj.
RV103 = Receive Meter

RV201 = Modulation AMC
RV202 = Transmit Meter

RV301 = Ant. Warning

Receive Adjust = L101,L102,L103,L104,L105,L106,L107

Transmit Adjust = L301,L302,L303,L304,L305,L306

2001 (Export Model)

RV101 = Squelch Adjust
RV103 = Receive Meter

RV201 = Modulation AMC

RV202 = Transmit Meter

Receive Adjust = L101,L102,L103,L104,L105,L106,L107

Transmit Adjust = L301,L302,L303,L304,L305,L306

3001 (77-003)

RV101 = Squelch Adj.
RV103 = Receive Meter

RV201 = Modulation AMC

RV202 = Transmit Meter

PACE RADIOS

8016

R107 = Meter Zero Adjust
R108 = Receive Meter

R114 = Squelch Adjust
R169 = Modulation AMC

Receive Adjust = L113,L111,L108,L102,L101
Transmit Adjust = L115,L114,X112,L109,L106

8155

R202 = Transmit Freq Adjust
R203 = 10.240 Xtal Adjust

R310 = Modulation AMC
R425 = Transmit Meter

R544 = Receive Meter
R549 = Squelch Adjust

Receive Adjust = T509,T508,T507,T506,T505,T504,T502,T503
Transmit Adjust = L401,T401,T402,T403,L404,L407,L408,C432

8193

VR2 = Receive Meter
VR3 = Squelch Meter
VR7 = Modulation AMC

VR9 = Transmit Meter
VR11 = SSB Power ALC
VR14 = Final Bias(80Ma)

CT1 = 10.240 Adjust
CT2 = 10.2385 Adjust
CT3 = 10.2415 Adjust
CT6 = SWR Calibration

Receive Adjust = T1,T2,T3,T4
Transmit Adjust = T8,T9,L4,L3,L2,L12

REALISTIC RADIOS

TRC-413

VR2 = Squelch Adjust

VR5 = Receive Meter Lights

VR6 = Transmit Lights

Receive Adjust = T1,T2,T3,T4,T5,T6,T7
Transmit Adjust = T10,T11,T12,L3,L6

TRC-421

VR1 = Receive IF AGC
VR2 = Squelch Adjust

VR5 = Receive Meter
VR6 = Transmit Meter

CT1 = 10.240 Xtal Adjust
[Freq. Counter to T10 Secondary]

Receive Adjust = T1,T2,T3,T4,T5,T6
Transmit Adjust = T15,T16,T17,T18,L9,L12,T19

TRC-451

VR1 = Receive Meter
VR2 = Squelch Adjust
VR3 = Transmit Freq. Adjust
VR4 = Carrier Balance

VR5 = Modulation AMC
VR6 = SSB Power ALC
VR7 = Transmit Meter

VR8 = Final Bias Adjust
VR9 = Driver Bias Adjust
VR10 = Am Transmit Power

Receive Adjust =
Transmit Adjust = L40,L39,L38,L37,L27

TRC-473

VR1 = Receiver Meter
VR2 = Squelch

VR3 = Transmit Meter

VR4 = Modulation AMC

Receive Adjust = L1,L2,L3,L4,L5
Transmit Adjust = L12,L11,L8

TRC-492

VR1 = Transmit Meter
VR2 = Receive Meter

VR3 = Squelch Adjust
VR4 = Power Supply Adjust

TC1 = 10.240 Xtal Adjust
L11 = 54 MHz Adjust TVI

Receive Adjust = T1,T2,T3,T4,T5,T6
Transmit Adjust = T9,T10,T11,L2,L3

ROYCE RADIOS

607

VR101 = Receive RF AGC
VR102 = Squelch Adjust
VR103 = Receive Meter

VR109 = Audio Power Adjust
VR201 = Modulation AMC
VR301 = Transmit Meter

VR302 = AWI Adjust #2
VR501 = Transmit Freq. Adj
CT301 = Transmit Power Adjust
CT302 = AWI Adjust #1

Receive Adjust = T101,T102,T103

Transmit Adjust = T503,T504,T301,T302,L303,L304,CT301

SBE RADIOS

LCM-8 (Land Command)

RV1 = Squelch Adjust
RV2 = Modulation AMC

RV3 = Receive Meter
RV4 = Transmit Meter

CT1 = 10.240 Xtal Adjust

Receive Adjust = T16,T15,T14,T13,T12,T11,T10,T9

Transmit Adjust = T8,L7,L11,L12

TEABERRY RADIOS

STALKER IV

VR3 = Squelch Adjust
VR4 = Receive Meter

VR5 = Transmit Meter
VR6 = Modulation AMC

VR7 = Receive IF Gain

STALKER IX

VR1 = Receive Meter
VR2 = Squelch Adjust
VR5 = Carrier Balance

VR6 = Am Transmit Power
VR7 = SSB Power ALC
VR8 = Driver Bias (35 mA)

VR9 = Final Bias (45mA)
VR10 = Transmit Meter

Receive Adjust = L1,L2,L3,L4,L5,L6,L7,L8,L9,L10

Transmit Adjust = L26,L27,L28,L29,L36

STALKER XX

VR1 = Receive Meter
VR6 = Am Transmit Power
VR7 = SSB Power ALC

VR8 = Driver Bias
VR9 = Final Bias
VR10=Transmit Meter

VR11= Modualtion AMC
VR12=Modulation Meter
VR510=Squelch Scan Level
VR502=Squelch Range Adjust

Receive Adjust = L3,L4,L5,L6,L7,L8,L9,L10

Transmit Adjust = L26,L27,L28,L29,L36

TRISTAR RADIOS

TRISTAR 240 (Old Version)

RV1 = Receive Meter
RV3 = Squelch Adjust

RV4 = Transmit Freq. Adj.
RV5 = Transmit Meter

RV6 = Ant. Warning Ind.
RV7 = Modulation AMC
(RV7 not in all Units)

Receive Adjust = T1,T2,T3,T4,T5

Transmit Adjust = T8,T9,T10,L14,L16,L17

PRESIDENT/UNIDEN RADIOS

AR-7 & AX-7

VR1 = Receive IF Gain
VR2 = Receive Meter

VR3 = Squelch Adjust

AR-144 & AX-144

VR1 = Receive Meter
VR2 = Squelch Range Adjust
VR3 = Transmit Frequency Adjust
VR4 = Carrier Balance

VR5 = Modulation AMC
VR6 = SSB ALC
VR7 = Transmit Meter

VR8 = Final Bias Adjust
VR9 = Driver Bias Adjust
VR10 = AM Power Adjust

Receive Adjust = L3, L4, L5, L6, L7, L8, L9, L10
Transmit Adjust = L40, L39, L38, L37, L27

AR-711 & AX-711

VR1 = Receive Meter
VR2 = IF Receive Gain

VR3 = Transmit Meter
VR4 = Squelch Adjust

VR5 = Modulation AMC

GRANT DX

VR1 = Am/Fm RX Meter Adj.
VR2 = SSB RX Meter Adj.
VR3 = SSB Squelch Adj.
VR4 = Am/Fm Squelch Adj.
VR5 = Fm Deviation

VR6 = Tx Frequency Adj.
VR7 = Carrier Balance
VR8 = Transmit Meter
VR9 = Final Bias #1
VR10 = Final Bias #2

VR11 = Driver Bias
VR12 = SSB Power ALC
VR13 = Am/Fm Tx Power
VR14 = Modulation AMC

McKinley

VR1 = Receive Meter
VR2 = Squelch Adjust
VR3 = Transmit Freq. Adjust

VR5 = Carrier Balance
VR6 = Am Power
VR7 = SSB Power ALC

VR8 = RF Driver Bias 35mA
VR9 = RF Final Bias 45mA
VR10 = Transmit Meter

Receive Adjust = L1, L2, L3, L4, L5, L6, L7, L8, L9, L10
Transmit Adjust = L26, L27, L28, L29, L36 (L39 is the 54MHz Coil for TV interference)

PC-33

VR1 = Receive Lights

VR2 = Squelch Adjust

VR3 = Transmit Lights

PC-55

VR1 = Receive Lights

VR2 = Squelch Adjust

VR3 = Transmit Lights

Receive Adjust = L1, L2, L3, L4, L5
Transmit Adjust = L14, L15, L12, L11, L8

PC-66A

VR1 = Receive Meter
VR3 = Transmit Meter

VR4 = Squelch Adjust
VR5 = Modulation AMC

VC1 = 10.240 Xtal Adjust

PC-77

VR1 = Receive Meter
VR2 = Squelch Adjust

VR3 = Transmit Meter

VR4 = Ant. Warning AWI

Receive Adjust = L3, L4, L5, L6, L7, L8
Transmit Adjust = L18, L17, L16, L13

PC-244

VR1 = Receive Meter
VR2 = Squelch Adjust
VR4 = Carrier Balance

VR6 = SSB Power ALC
VR7 = Transmit Meter
VR8 = Final Bias (10mA)

VR9 = Driver Bias (10mA)
VR10 = Am Power

PRESIDENT/UNIDEN RADIOS

PRO- 510e & PRO-520e

VR1 = Squelch Adjust
VR2 = Transmit Lights

VR3 = Receive Lights

VR4 = Receive Gain

Receive Adjust = L1, L2, L3, L11
Transmit Adjust = L6, L9, L5, L4

PRO-530e

VR1 = Squelch Adjust

VR2 = Transmit Lights

VR3 = Receive Lights

Receive Adjust = L1, L2, L3, L4, L5, L6, L8, L8
Transmit Adjust = L14, L11, L10, L9

PRO-710e

VR1 = Squelch Adjust
VR2 = Receive Meter

VR3 = Transmit Meter

VR801 = Power Supply Voltage

Receive Adjust = L1, L2, L3, L4, L5, L13
Transmit Adjust = L11, L8, L7, L6

PTC-104 TRUCKER

VR1 = Squelch Adjust
VR2 = Receive Meter

VR3 = Transmit Meter

VR4 = Modulation Meter Adj.

Receive Adjust = L2, L3, L4, L5, L6, L7, L16, L23
Transmit Adjust = L18, L19, L21, L15, L11, L9, L8

UNIC RADIOS

CB-40

RV1 = Squelch Adjust
RV2 = Receive LED Level

RV3 = Transmit LED Level

RV4 = Modulation AMC

Receive Adjust = T1, T2, T3, T4, T5
Transmit Adjust = T7, T9, T10, T11

CB-50

RV3 = Squelch Adjust
RV4 = Transmit Frequency Adj.

RV5 = Transmit Meter

RV6 = Ant. Warning AWI

Receive Adjust = T1, T2, T3, T4, T5
Transmit Adjust = T7, T8, T9, T10

XTAL RADIOS

XCB-71

VR101 = Receive Meter
VR102 = Squelch Adjust

VR201 = Transmit Meter

VR202 = Modulation AMC